WHAT MICHIGAN IS NOW DOING
IN REGARD TO FOREST
FIRE PREVENTION

6

An informal title for the formal Annual Forestry Report of the Game Fish and Forestry Department State of Michigan Reported to the Public Domain Commission

Featuring Inspection of Locomotives and Rights of Way

Featuring Michigan Forest Scouts School boy Auxiliary Fire Wardens

By Direction of

WILLIAM R. OATES
STATE GAME FISH AND FORESTRY WARDEN

Text by J.H. McGillivray

Designed by J.E. Maynard Co. LANSING MICH.

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WHAT MICHIGAN IS NOW DOING IN REGARD TO FOREST FIRE PROTECTION

AN INFORMAL TITLE FOR THE FORMAL ANNUAL FORESTRY REPORT

OF THE

GAME, FISH AND FORESTRY DEPARTMENT

STATE OF MICHIGAN

1912

BY DIRECTION OF

WILLIAM R. OATES,

State Game, Fish and Forestry Warden.

Introducing, besides Departmental Statistics:

MICHIGAN FOREST SCOUTS

(SCHOOL BOY AUXILIARY FIRE WARDENS)

INSPECTION OF LOCOMOTIVES AND RIGHTS OF WAY

(IN CO-OPERATION WITH THE RAILWAYS OF THE STATE)

A HUMAN INTEREST TEXT

WHICH CONCERNS:

The Governor of the State.
Michigan Legislators.
The Established Farmer.
The New Settler.
The Railway Official.
The Railway Employe.
The School Boy.
The School Girl.

Fur Bearing Animals.
The Birds.
The Horticulturist.
The Huckleberry Picker.
The Hunter, Trapper, Camper, Fisherman.
The Urbanite.
The Suburbanite.
Every woman, man and child in Michigan.

TEXT BY J. H. McGILLIVRAY.

LETTER OF TRANSMITTAL.

To the Public Domain Commission of the State of Michigan:

Gentlemen: Pursuant to the requirements of Section 5, Act 280, Public Acts of 1909, known as the act creating the Public Domain Commission, I have the honor to transmit herewith the Forestry report of this Department—1912.

Very respectfully,
WILLIAM R. OATES,
State Game, Fish and Forestry Warden.

INTRODUCTION.

That the average statistical report is tossed to the waste basket or is laid among the archives with a cursory perusal or none at all, except by those who are particularly interested in the subject matter, is known to all of us by our individual treatment of them, that their formality—perhaps their guarded perfectness—robs them of the interest which the subject often merits, is known or suspected.

It is the purpose of this department in presenting this report on a subject so vital to the welfare of the people of this state, to garnish it with human interest, at the possible risk of being censured for departure from ethics.

We desire to interest you in the prevention of forest fires—it is a true matter for the interest of all the peoples of Michigan.

We desire particularly to interest you in our recent inovations for immediate material benefits in fire prevention in Michigan:

(1) THE FOREST SCOUT MOVEMENT.

(2) INSPECTION OF RAILWAY LOCOMOTIVES AND RIGHTS OF WAY.

WILLIAM R. OATES,
State Game, Fish and Forestry Warden.

AN OUTING IN MICHIGAN FOREST.

Let us perpetuate this primeval beauty.

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A SCOUT'S ANALYSIS OF A MICHIGAN ROAD.

Came a Scout to his supervisor, with queries in regard to the worn depression in granite "float" boulders which lay on a path having the same general course as one of our "modern" Michigan highways, near the Thunder Bay river, which empties its waters in lake Huron.

The Scout had noticed that in many instances old paths could be found running in general parallel direction with our roads.

"You see," said the Scout, "that boulder, in spite of its hardness, is worn down over 20 inches on the side toward the road? Now, I don't think our road commissioners, or whoever recently laid this particular road out, need be terribly set up over their work.

"There must have been travel over this road before Columbus discovered America, before Solomon builded his temple; perhaps when Adam and Eve were eating apples.

"Isn't it possible that a grizzly bear or one of those giant mastadons was really the first engineer to lay out this road?"

Now this isn't *verbatim* what the Scout said but it's what he meant.

And it came to the supervisor that he had either read or thought some time of this same thing:

That there *is* a class of engineers, older than the schools, more unerring than mathematicians. That the wild animals which traverse the forests, not by compass but by instinct, find the easiest paths to the lowest passes of the hills, to the shallowest fords, to the richest pastures, to the salt licks, to the foraging grounds, to the leafy bowers which shelter love and mating. That they travel untold miles, unguided except by this instinct or of the collective experience of their progenitors through ages.

To how many adult persons in Michigan has this thought about the first engineering of our roads occurred?

The point is: The Michigan Forest Scout who can, on his own initiative, note and appreciate such findings, indicates possession of qualities worth while in the service of the state in FOREST FIRE PREVENTION—if he is, *only a school boy.*

SOME HUMAN INTEREST.

It is a far cry from little baby blacksnakes to the big subject of forest fire protection. Is it?

"See here Colonel," said a ten-year-old Michigan Forest Scout to his field supervisor, a deputy state forestry warden, "this here 'cyclopedia says snakes don't swallow their little kid snakes when they get scared as some people think they do. It says when somebody sa'prises 'em that the young'ns run down a hole in the ground. Now Harry Masterson and I—we've got a snake that swallowed its young'ns—I don't care what the book says—we've got it over in Harry's barn in a mosquito screen box—it's swallowed 'em three times and we saw it—didn't we Harry?"

And "Harry" triumphantly endorses the assertion of the first Scout, and the supervisor accompanies the boys to Harry's barn, and he sees the old lady blacksnake and a dozen little ones. When the blacksnake, *mater,* notes the intrusion she opens her mouth with a funny snake screech and all the baby serpents rush for the mother's head and wriggle down her throat by ones and twos and threes.

The supervisor is now escorted to the school library by the jubilant boys and reads in a "standard" encyclopedia under the caption, "Snakes," this assertion by a *learned* scientist:

"There is a popular fallacy that snakes swallow their young. That it is a fallacy may be proven by observation. You will note a hole in the ground near the mother snake's head in which the young snakes seek refuge when the mother is alarmed....".

So, the supervisor went back to the snake cage in the barn, to make very sure that his eyes had not deceived him. He saw that there was no hole in the screen through which even the baby snakes might disappear. To make assurance doubly sure, with the consent of the boys, he killed the old lady snake and took the live youngsters from an incisure in the side of the adult body.

So, the boy who would not take another's assertion in the face of his own observation proved that a ten-year-old Michigan Forest Scout might know more about some things than a learned scientist; more, the boy won a State medal for his perspicacity.

And another Forest Scout proved that the "crazy" time, attributed to partridge or ruffled grouse in the early fall, when the birds fly into the forest district towns and against walls, trees and other objects, was not "crazy" time at all, unless a partridge could be said to be "crazy drunk," as that term is applied to man.

AUXILIARY FIRE WARDENS.

Forest Scout Authority Badge, worn by two thousand, five hundred Michigan school boys.

The Scout found that the grouse would gorge themselves on wild grapes and other fruits in autumn days, and, allowing the fruit juices to ferment in their crops, go on glorious old bats, which often ended as disastrously for the bird as it is prone to end for man.

And this scout won a medal for his investigation and finding.

Yet another Scout found that the "bullhead" fish of the Michigan lakes and ponds actually suckled its young, which were shown the supervisor, swarming about the mother in hundreds and pressing close for the white milk exuded.

This Scout, like the others, won a medal, for the Department holds that a boy on the constant lookout for such things may discover benefits to the State and, in any event, is a boy better fitted for that particular service for which the Scout is enlisted—FOREST FIRE PREVENTION.

MORE ABOUT SCOUT OBSERVATION.

Isn't it wonderful, the many shades of color which the maples show in autumn? They are all "variegated"—are they not? Now that is what some casual observer, even the true nature lover might tell you.

But the Michigan Forest Scouts, or one of them, will tell you something different. He will show you a maple tree that does not display variegated colors. He will invite your attention to one the leaves of which all turn silver in autumn; another, the leaves of which all turn a shade of red; another, the leaves of which all turn a shade of brown; but he will also allow that there are maples which are variegated, displaying many colors in their own leaves.

How many kinds of oak trees are there in Michigan?

"Oh, there's the *red* oak, and the *white* oak, and the *swamp* oak, and the *scrub* oak . . .," right here, unless you have given this subject particular study, you hesitate—you have covered the limits of your knowledge.

A Michigan Forest Scout will tell you that there are many, many kinds of oak growing in his state and show you the differentiation. He will prove to you too that trees are like human beings in many respects —that they rest, and sleep, and work and are sympathetic.

A Michigan Forest Scout will tell you things that animals will do—things that have come under the positive observation of keen boy eyes—that would relieve the so-called "nature fakir" of much of the abuse heaped on his poor head.

One Michigan Forest Scout had read and been told again and again that to float when in bathing you must lie on your back in the water. He tried to float in accordance with the directions, but found that neither the directions nor the water would support him.

He found that his lower limbs with their heavy bones sank first. It came to him that the place for his feet was down where the water by

its added density afforded them the most support. A horizontal position in the water, with his head thrown back, always retaining a half supply of air in his lungs, and the Scout floated without trouble. Through this Scout's finding hundreds of the school boys of Michigan know, for the first time, how to float. This knowledge may help to save their own or other lives. A finding by one Scout is early transmitted to the several thousand other Scouts. What the individual learns, they all soon know.

DOES ALL THIS APPEAR IRRELEVANT?

Have patience, please. We will connect the Scout with fire prevention before we finish this text.

We are simply introducing the Forest Scout to you in such a way that he will be a tangible, live, personality; in such a way that you will perceive that we are giving him a heart interest in his commonwealth.

It is this general heart interest that is going to accomplish the specific purpose for which the Scout *movement* was planned, VIZ.: FOREST FIRE PREVENTION and REFORESTATION.

For, the Scout, investigating the forest, with the things pertaining to out-door life, will soon perceive that, even in its woeful condition of depletion, it is still the greatest natural increment of wealth the State commands.

This Scout desires a duck dinner, but he'd discard his gun to extinguish a forest fire.

FIRE PREVENTION VITALLY IMPORTANT.

We should give the matter of forest fire prevention our concern, because:

FOREST FIRES have caused the loss of many lives in the State of Michigan.

FOREST FIRES have caused the loss of billions of dollars, value in timber, in the State of Michigan.

FOREST FIRES rob the soil of its humus and renders unfit what might otherwise be rich land for general agricultural purposes.

FOREST FIRES, until recent pooling of lumber interests in preventive work and the organization by the State of "Michigan Forest Scouts" and Practical Railway Locomotive Inspection, in 1912, have destroyed more timber in Michigan every year than has been harvested by lumbermen.

FOREST FIRES destroy timber, which, if harvested, would distribute to labor an average of $10 on every thousand feet.

FOREST FIRES distribute nothing of value, but cause death and destruction—a merciless waste.

FOREST FIRES are a *CALAMITY* and rank properly with *flood, pestilence, famine, earthquakes* and, like them, are soon forgotten by those who have the power to establish precautionary measures against them, if not by those who have suffered personal property loss, or the Shades of those whose lives have been sacrificed to the carelessness of those who should provide.

A METALLURGIC FOREST.

Let us plant a forest of metal trees on some area that fire has robbed of its pines.

We could give each tree a trunk of pure copper, branches of pure silver, an exterior bark and leaves or needles of finest gold—we could plant acres and acres of such forest with the value of Michigan's forests of wood which have been destroyed by fire through what we may justly term the MORAL, CRIMINAL NEGLIGENCE of her citizens.

Based on figures compiled by The American Lumberman, acknowledged the highest authority on statistics of lumber harvesting, the value of *merchantable* timber alone, destroyed by fire in Michigan, since the advent of the saw mill, (more than double the amount manufactured) would be, approximately ten billions of dollars.

Go into some piece of forest not yet ravaged by fire. For every *merchantable* tree (trees of a size that can be utilized in the manufacture of lumber), you will find several trees lacking complete size, a dozen lesser saplings, a score of seedlings.

The pro-age value of such partial growth, that has already been destroyed by fire in this state, would mean in money an amount almost beyond the limits of our comprehension.

Hungry forest fire sufferers waiting for allotment of "Fodder."

FIRE PREVENTION = REFORESTATION.

Why couple "fire prevention" with "reforestation"?
Fire prevention means reforestation, if effective.
Reforestation means fire prevention, if effective.
These are obvious truths and need no further explanation.

Abruptly, we desire to present to the reader two meaningful pictures:

The first picture is an actual photograph of the destruction by forest fires of the populous towns of Oscoda and Au Sable, July 11, 1911, taken from "Piety Hill" by a daring artist at the heighth of the conflagration which resulted in a property loss of upwards of $3,000,000.00 and the sacrifice of a score of lives.

See first picture, over.

MINNESOTA'S WISDOM.

See second picture, over.

Minnesota saw this forest and the possibilities of natural, *protected*, growth and the legislature of that state has provided for an annual appropriation of at least $150,000 for forest fire prevention.

Michigan, with thousands of acres of slashings in excess of Minnesota, appropriated for 1912 ten thousand dollars for a like purpose; some of her wardens having actually to stand part of their official expenses by the use of their nominal salary, to conserve the meager appropriation.

MICHIGAN'S 1911 FIRE LOSS.

Last year the loss in Michigan through forest fires was nearly $4,000,000.00. This was on readily estimated property such as has always appeared in state statistics. The actual loss, were seedlings and sapling trees to be considered, was more than twice that amount, say, $10,000,000.00.

THE UNESTIMATED LOSS.

When there comes a forest fire, loss resultant is not only the dead loss, but there is also the unestimated loss of what might have been actual gain.

"Ten thousand dollars" WOULD SEEM INADEQUATE INSURANCE AGAINST FOREST FIRE POSSIBILITIES IN MICHIGAN!

Permit us to reintroduce the MICHIGAN FOREST SCOUTS:

The personnel of the Scouts at the time of this printing is approximately 2,500 Michigan school boys, from 8 to 18 years, inclusive. Eventually the Scouts will number upwards of 5,000.

The Scouts are enlisted, according to the prospectus of their text book,

FOR THE PROTECTION OF FRONTIER LIFE AND PROPERTY AND REFORESTATION.

And As

AUXILIARY FIRE WARDENS.

The enlistment of the school boys was suggested by Governor Osborn following the destruction of Oscoda and Au Sable by forest fires, and this Department exploited the movement.

A deputy was assigned to the field supervisorship, September, 1911.

The deputy talked to assemblies in the High schools of the forest districts and material was developed for a text book which recites the duties of a Scout in out-of-doors life, first aid to injured, and particularly in the extinguishing of small forest fires and the reporting of large ones. Instruction is given in simple methods of forest fire fighting. Surveying and timber estimating were included in the text and approximate quotations given on stumpage so that the Scout might determine values of the timber he was protecting.

The result of the Scout movement has been:

HE HAS EDUCATED HIS SISTER AND BROTHER AND FATHER AND MOTHER AND THEIR NEIGHBORS TO THE IMPORTANCE OF THE PREVENTION OF FOREST FIRES.

His work, complemented by that of the regular State and Lumbermen's Association service, has brought Michigan the first year in the history of the state that forest fires have not destroyed more timber than has been manufactured into lumber.

Five hundred and nine fires have been extinguished or reported by the Scouts during the dry season of 1912. Fifty-six of these fires were put out by the Scouts without adult aid.

At least three of these fires were such in nature and extent as to tax the ingenuity and intelligence of the best men fire fighters.

SCOUTS IN ACTION.

Near Munising, in May, 1912, Capt. Albion Bloom with ten of his Forest Scouts gave such aid to the township fire warden, W. R. Burns,

DESTRUCTION BY FOREST FIRES OF TWO POPULOUS TOWNS, OSCODA AND AU SABLE.

Had residences on the hill in the foreground not been sheltered on the west by green side-hill oaks which afforded a vantage point for fire fighting, more than 1,000 refugees who fled here for safety would undoubtedly have perished in the flames.

Had a tramp steamer, the "Niko" of the Edward Hines fleet, Chicago, not opportunly came into port that its captain might send a telegram to his owner, 384 persons, hemmed in by flames in "Shoretown" would have proved an offering to the god, or fiend, Negligence.

FOUR FORESTS LIKE THIS ONE WILL GROW IN ONE LIFE TIME.

Our second "meaningful picture." It shows a harmless and helpful forest of larch. Gifford Pinchot, former United States Forester, is sponsor for the statement that this European importation (akin to an American production), planted 17 years ago in western Minnesota at a cost of $64.45 per acre, has a true value today of $484 per acre for lumber utilization.

The present value of this forest, coupled with future values in reproduction by itself, would reach far past immediate utilization value.

that he attests his appreciation in a complimentary letter to the Department.

Near Mio, in July, 1912, Lieutenant Russell Mapes with Sergt. Bliss Nolan and Scouts Clyde Thompson, Glenn Thompson, Edmund Hershberger, Dwight Stark, and Warren Cripps registered in class "A" as fire fighters.

These, mere boys, the oldest one 16 years of age, discovered a fire covering more than 200 acres which did not interest the older citizens.

They secured a horse and plow and ran several furrows across the front of the fire.

Unable to check the fire at the first stand, they duplicated the work several hundred yards ahead.

Again the fire failed to succumb at the dead line.

Then the boys headed the fire front by half a mile, taking advantage of a sparse forest line at this point. They put ten furrows across the path of advance. The fire did not pass—the wide lane proved efficient.

Several miles south of the operation of these Scouts, a small fire, fanned by the wind of the succeeding day, swept over an area of several miles eastward before it could be checked. Had towns been in its path they would undoubtedly have been destroyed.

Had the first fire remained unextinguished until the succeeding day it is possible that the town of Mio, situated in what would have been its eastward path, would have been devastated. It would have meant a loss of more than one million dollars.

In August, 1912, the same company of Scouts extinguished a fire of almost the same magnitude several miles north of Mio.

On the "Wilber" road, near East Tawas, in August, 1912, three women engaged in picking berries fought a grass fire with brush flails for four hours, succeeding in extinguishing it before it reached the timber line. Had the fire entered the timber in the dry condition of underbrush then obtaining it is likely that a disastrous fire would have resulted.

One of the women was the mother of a Forest Scout and had read in her boy's text book the method of fighting grass fires with brush flails. The three women are now honorary Scouts.

Near the present city of Oscoda, Scout Benton B. Marks, in May, 1912, discovered the bridge of the A. S. & N. W. railway on fire. He dispatched a farmer's boy, James Barlow, seven years of age, for shovels and flailed the flames temporarily with brush.

Using the shovels the two boys killed the flames with sand and in a few minutes saved what would have been a loss of several thousand dollars. Both boys won the state medal award and Barlow, though under Scout age, is now an honorary Scout.

Raymond Hoban, Scout captain at Comins, ran barefooted seven miles

at four o'clock in the morning for the township fire warden, and by so doing saved the town from destruction.

HOW SCOUTS ARE TRAINED.

When a fire is discovered, the scout having first knowledge of it is to make report to the township warden. He is asked to make an intelligent report along these lines:

The kind of material in combustion.

The approximate area of destruction.

The probable area of destruction.

The establishment of a fighting line.

The means for fighting: water, sand or earth, flails, brush or water-soaked sacks or blankets, fire lanes, etc.

While it is not intended that any boy shall risk his life in fighting fire, it is to be expected and is of course desired that the scouts shall deal with smaller fires which are dangerous principally because of the danger that they might spread. The method of attack on a blaze is thus described by Captain Oscar Swanson of Wolverine Company, Oscoda.

"We figure on getting most of the fires before they get any size. We just cut or tear off a big pine or cedar branch and whip 'em to a frazzle. We get behind to the windward where it's safe. Then we whip along the sides and it keeps dying down as we gain on it, till we meet in front. Then it's out.

"What'll we do with a great big fire? Why, there won't be any. That's what the scouts are for—to put 'em out when they are small. But if there should happen to be a big one, we would report it to the township fire warden and he would organize to fight the blaze. Most of the fires start when it's vacation in school and that's when we can watch for 'em.

"When there are no fires? Why then we'll put in the time cutting fire lanes to protect the towns and farm houses and trimming the useless branches off the trees so the sap will go into the trunk and make 'em grow faster and planting seedlings. Pretty soon we'll have our forest back again."

PLEASE READ THIS

STATEMENT

3

TIMES.

"Minnesota has an immense timbered region, the products of which are by no means exhausted; if fire is excluded from all the 'cut-over' areas, *more timber will grow each year than is used.*

"There are approximately 28,000,000 acres in the state bearing timber of some kind, and of this area probably 15,000,000 acres will always remain in forest."

From annual report Minnesota State Forester, 1911.

PLEASE READ THIS

STATEMENT

3

TIMES.

Michigan has a much depleted timbered region the products of which are by no means exhausted; timber is still, *if properly cared for,* the state's greatest natural increment of wealth. There are approximately 9,000,000 acres in Michigan which will for centuries remain timber bearing land, having a greater economic value for lumber production than for general or any special agricultural purpose. The approximate value of the standing merchantable timber in Michigan today is $200,000,000.

If fire is excluded from all the young timbered and "cut over" area for a period of 25 years and none of what is now saplings and seedlings is cut in the meantime, a young growth of what, *with proper milling machinery* can be termed "merchantable" timber will obtain in Michigan to the extent of at least 25,000,000,000 feet. This timber would have a stumpage value of at least $2 per thousand feet, *a grand value of:* $50,000,000.

And this is only an estimate of the natural growth minus fires. Let the Forest Scouts plant seedlings for 25 years and it will give a supplementary growth worth while.

And, as you will always find in a district wooded by nature a majority of *undersize* growth: *more timber will grow each year than is used.*

A NEW SIZE SAW MILL
For
A NEW SIZE TIMBER.

When the layman or the average experienced lumber manufacturer thinks of lumbering operations, his mind conceives timber of miscellaneous size and a mill fitted for same, whether it be the mammoth "two-side" mill with resaws, employing 30 to 50 men, or the "portable" mill with its short complement of labor and a product the "mill-culls" of which make the carpenters grumble.

Did you know, Mr. Lumberman, that a stand of young pines, artificially planted, shows little variance in growth of the individual trees for the first 25 years?

Young pines are like young radishes; like human beings. They are strong, healthful, and only in freaks are found defects. It is old age which brings to the trees, rheumatism and lumbago and heart disease and tuberculosis. There are on plantations of the federal forest reserves acres and acres of young white-pine trees which are absolutely void of defects as considered from the manufacturer's standpoint.

Saw up the average "18-logs-to-the-thousand-feet" pine timber that can be secured in Michigan today in the regulation saw mill and it will give you approximately:

1 per cent "C and Better," worth.....	$35 00 per M.	$0 35
12 per cent "No. 1 Common", worth.....	24 00	2 88
25 per cent "No. 2 Common", worth.....	20 00	5 00
25 per cent "No. 3 Common", worth.....	16 00	4 00
20 per cent "No. 4 Common", worth.....	14 00	2 80
17 per cent "No. 5 Common", worth.....	10 00	1 70
		$16 73

Saw up a planted growth of white pine timber, 25 years old, conservatively "28-log-timber," in the "new" saw mill and it will give you approximately:

25 per cent, "D Select and D Common," worth	$28 00 per M.	$7 00
35 per cent No. 1 Common, worth.....	24 00	8 40
30 per cent No. 2 Common, worth.....	20 00	6 00
7 per cent No. 3 Common, worth.....	16 00	1 12
3 per cent No. 4 and 5, worth.....	10 00	30
		$22 82

A forty-year-old stand of Red (Norway) pine. White pine, a more valuable product, will attain similar development in 30 years, but requires somewhat better soil.

WHAT AN "OLD TIMER" MILL SAWYER SAYS.

On a railway train recently the writer was presenting with enthusiasm his proposal to have the school-boy Forest Scouts plant seedlings; his vision of results in afforestation and reforestation, artificial and natural, if fires could be excluded from the working area; his idea of the *"new"* mill fitted for sapling growth.

He was addressing John W. Anderson, formerly with R. Hanson Co., Grayling, now of the White Lumber Company mills at Boyne City, for 16 years a mill sawyer.

When he had shown that a uniform growth of pine, say 8 inches in diameter, would require in operating no skidding, no decking, no toggle chains, no "Saginaw twists" or "Canadas", no "top-loading", no canthooks, no peavies, no scheme of "felling," no "cross-hauls," little "swamping," but one man to a saw, only the final hauling horses; when he had eliminated most of the accepted requirements of lumbering as now conducted and given plausibility to the fact that a man at each end could toss the log or bolt in the sleigh or truck rack; that the actual lumber contents of such logs, *for cost of operation,* would equal if not exceed the product of the larger timber regarded by lumbermen as "merchantable," his listener nodded endorsement.

"Snaked from the choppings with one horse and loaded in the rack," continued the writer, "the logs would be hauled up the incline at the mill and released on the cribbed rollway. From the rollway they would be tripped in succession to the 'jack' with its endless chain and especially arranged 'dogs'; thence through adjustable saws, appearing on the table of a 'Jumbo' or gang edger as 4 inch, 6 inch or 8 inch cants—mostly 4 and 6 inch.

"Strips or boards showing wane could be run through a 'baby' edger.

"Such a product, coming from white pine, could be continued through a machine and leave the mill as finished flooring, ceiling, partition, siding. Being of uniform fiber, properly piled, tongue, grove and body would cure and shrink with uniformity and prove practically as perfect matching when utilized in building as though it had been milled when dry. There is a set and an edge for planer knives which meets the needs of green lumber.

"In British Columbia mills today a mixed product which includes larch, hemlock, white pine, Western pine, white cedar, spruce, lodge-pole pine and mountain cedar is milled without segregation in a green condition. This conglomeration is often used in matched construction by the builder and little objection is heard in regard to fit of tongue and grove.

"Here we have an operating investment, in the woods, of the cost of axes and saws and hauling teams and vehicles against the decimally greater cost of accepted lumbering equipment. Here we have a saw mill and planing mill complete at a cost of say $20,000.00, as against $100,000.00 for the same mills equipped for the accepted "merchantable" timber.

"But all we have got in product is 4 and 6 inch strips. 'Such little pieces of lumber surely do not bring prices in comparison to the larger boards?'

"As a matter of fact a 4 in. white pine strip is worth more than an 8 inch board; a 6 inch white pine strip is worth more than a 10 inch board and often sells in the market at a price equivalent to 12 inch boards in feet contents.

"There are saw mills on the Pacific coast, milling the mammoth fir trees. The highest priced product of those mills for export are the 4 and 6 inch strips which cost in some cases more than $3 per thousand feet to reduce from the big board product of the big logs.

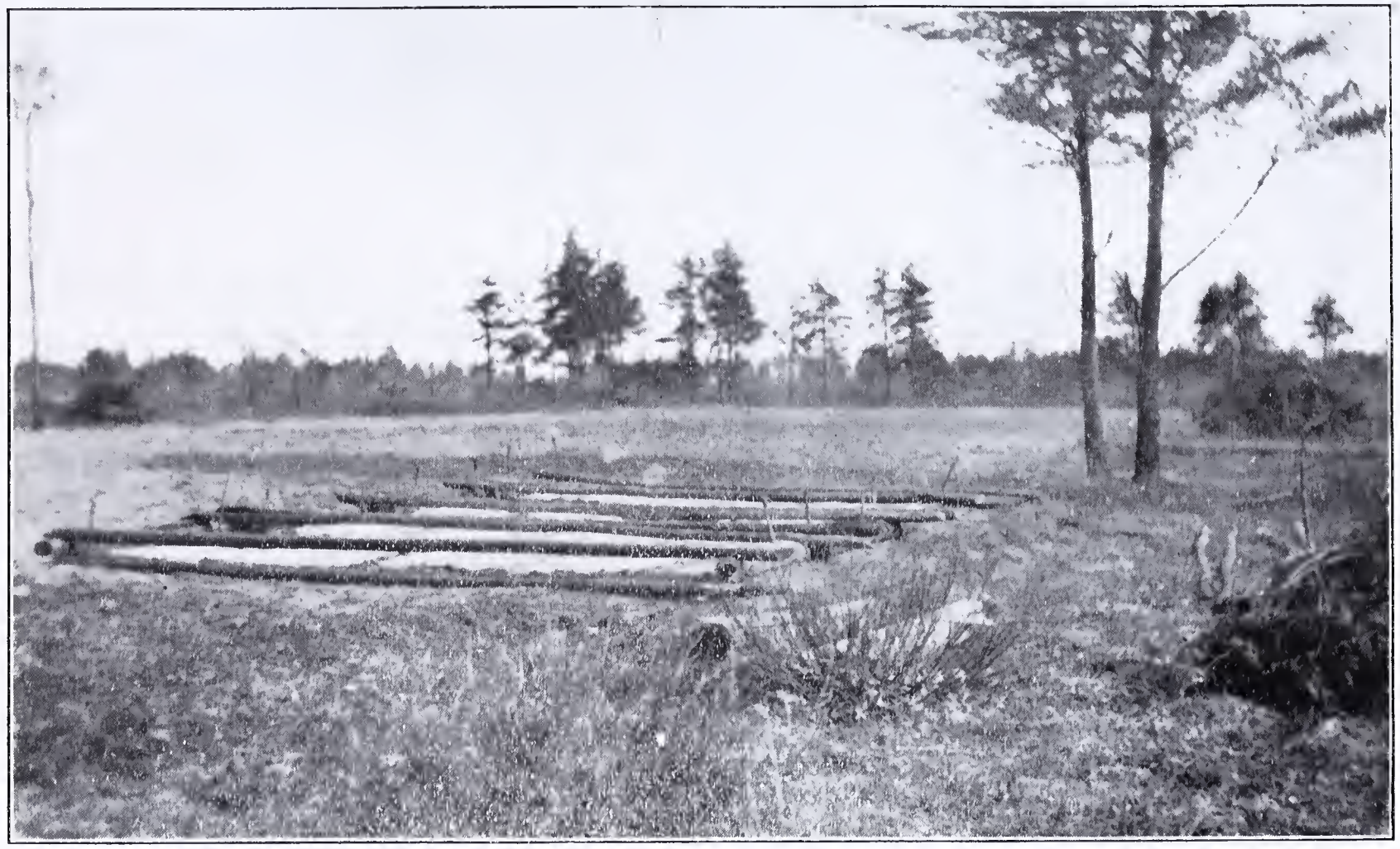
"Why should not Michigan make strips from fir trees of 25 year growth while the Pacific coast mills make their economic boards?"

AND THE OLD MICHIGAN SAWYER SAID: "You think you have got something new in all this?

"When I was a small boy in Sweden, 40 years ago, the school boys were planting pine trees. We had two weeks out of our regular term in summer when we did nothing else. I left there 32 years ago. Twelve years ago I was back home on a visit, and I saw them cutting the trees that I helped to plant, in practically the same mill that you suggest. I believe the net profit, allowing the same stumpage appraisal, is greater on the young growth with the 'new' mill than on the old growth with the old standard mill, considering the relative investments."

NOTE: "The average annual growth in all the forests in Sweden is greater than the annual cut per acre. The annual growth has been estimated at 25 cubic feet per acre; therefore the annual cut 19.1 cubic feet per acre could be increased from 954,000,000 cubic feet to 1,235,500,000 cubic feet without depleting the forests."

The Forest Resources of the World.—Raphael Zon.



White Pine Seedling Beds planted by medal winning Forest Scouts near Oscoda.

FOREST SCOUTS
TO PLANT TREES.

It is proposed that the Game, Fish and Forestry department and its wardens work with the Public Domain Commission to plant on Public Domain and private lands, through the agency of the school boys of Michigan, at least 500,000 white and Norway pine seedlings during the year 1913.

Such seedlings may be obtained without limit from the Public Domain Commission plantations, situate at Roscommon on the Michigan Central railway.

It is proposed, and railway men interviewed favor the proposition, to ask for a *frank* tariff over all railway lines in Michigan for transportation of seedlings to the hundreds of companies of Forest Scouts.

Such a tariff would have to originate through the courtesy of the Michigan Central railway, the receiving line, be endorsed by the freight association of all the lines and receive the approval of the State Railway Commission.

The Game, Fish and Forestry Department begs to respectfully submit to the Legislature of the State of Michigan:

That the management of several large lumbering concerns affirm that their holdings would, at the present rate of consumption, be perpetual in amount of stumpage if fires were altogether excluded from same.

That citizens, wholly public spirited, and others to protect their timber property, have expended their own moneys during the year 1912 to the amount of approximately $50,000 in forest fire prevention.

That a considerable amount of the cost of operation of railways traversing the state of Michigan, during the dry months of the summer season, has been an outlay for the prevention of forest fires along their rights of way.

That the Northern Forest Protective association, under the direction of Forester Thomas B. Wyman, Munising, has conducted a spirited campaign for the prevention of forest fires during the year 1912.

That the lumbermen of the lower peninsula, under the direction of Chief Warden Chas. F. Hickok, of the association, have for the first time in 1912 conducted a systematic campaign for the prevention of forest fires.

That the exploitation of the Forest Scouts has established a sentiment for the prevention of forest fires, not only by the positive material work

of the boys but by educational service, that has proven worth many times the pittance expended to forward the movement.

That the new interest taken in forest fire prevention, reforestation and conservation by the people of the state of Michigan is evidenced in the splendid congress which met at Lansing, June 12, 1912, under call from Augustus C. Carton, Secretary, Public Domain Commission.

That the hundreds of thousands of healthy seedlings developed at the nurseries of the Public Domain Commission at Roscommon indicate the splendid and efficient work of State Forester Marcus Schaaf and the Public Domain Commission.

That the plantations of pine and other species of woods at the Michigan Agricultural college, East Lansing, under the expert direction of Professor J. Fred Baker, afford evidence that white pine can be grown to merchantable size from the seed in less than 25 years.

That the Detroit Federation of Women's Clubs, with Mrs. R. H. Ashbaugh, of that city, as speaker, has with other women's clubs of the state endorsed the developing of public sentiment for forest fire prevention, conservation and reforestation.

That a resolution, adopted unanimously at the conservation Congress previously cited, introduced by Miss Lydia Day Holmes, Bay City, member of the National board Daughters of the American Revolution, read as follows:

Resolved, That this Conference express to the Superintendent of Public Instruction, to the Presidents of the State Institutions of Learning, to the President of the State Teachers' Association, the State Teachers' Club, the School Masters' Club and to the State Superintendents' Association, the wish that they and the organizations they represent, at their earliest convenience, earnestly consider the question of the advisability and the best methods of systematic conservation instruction in Michigan's public schools, with a view to some plan of regular systematic conservation instruction in the schools of the State.

That a fair and perspicuous consideration of conditions and requirements by our legislators, at this opportune time when public sentiment is receptive, will rescue the State of Michigan from its position as the synonym for all that is reckless and prodigal as regards its concern for its native forest wealth and its possibilities, and by adoption of the best procedure devised by other states and countries place this state in the forefront of progression.

BURNING OF METZ.

Seventeen persons were roasted to death in a Steel Gondola Car of a relief train, stalled on the displaced track in picture.

SCHOOL BOYS HAVE MADE SWEDEN ONLY COUNTRY ON GLOBE WHERE GROWTH OF FOREST EXCEEDS THE MANUFACTURER'S PRODUCT

Provinces of the Republic of France actually pay a large part of the general federal expense—what would otherwise be a direct tax on the people—by the income derived from her conducted forests.

There are provinces and municipalities in Germany and other European countries whose revenue from cultivated forests wholly exempt the citizens from taxes and provide surplus moneys.

THE SCHOOL BOYS OF MICHIGAN as "FOREST SCOUTS," through the sentiment attached to the movement, can eventually place Michigan on a par with Sweden, in producing more timber annually than is manufactured. It is not so much the positive work these boys may do, as we have said; it is the sentiment their work creates that will be effective.

"Sentiment," said a speaker at the Michigan Conservation Congress," is the greatest factor in world action. If it were not for sentiment there would be no science. Sentiment is the basis of all science, all commercialism. Everything splendid, everything noble, everything good, everything beautiful, that has been done with pen, or brush, or voice or hand; everything worth while here on earth has been born in sentiment, reared in sentiment and will be remembered and revered in sentiment."

SWEDEN, *the only nation utilizing the school boy movement,* has an annual adequate timber supply with an annual increase in stumpage.

MICHIGAN, utilizing her school boys, for the first time, in 1912, *for the first time, since the advent of the saw mill,* found practical immunity from forest fires.

LEGISLATIVE RECOMMENDATIONS.

We submit: That practical locomotive and rights of way inspection, as inaugurated by the Game, Fish and Forestry department in 1912, (See "Railway and Forest Fires" subdivision) be encouraged by legislation.

That provision be made for special deputy Forestry wardens who, under the direction of the Game, Fish and Forestry warden, shall have immediate supervision of the special work hereinbefore cited, with salaries compatible with requirements of technical skill and service.

That your honorable body earnestly consider the enactment of amendments to the existent forestry law, of a tenor similar to that of the draft which we here respectfully present:

An Act amending Act No. 249, of the Public Acts of 1903, as amended by Act No. 317, of the Public Acts of 1907, and adding Sections: 20 and 21, being additional provision for the preservation of forests in this state and for the prevention and suppression of forest and prairie fires and also providing for reforestation work.

The People of the State of Michigan enact:

Section 20. That the State Game, Fish and Forestry Warden shall appoint a special deputy Forestry warden whose title shall be Inspector of Railway Locomotives and Rights of Way, who shall have served at least ten years in practical railway employ, whose term of service for the state is not to be effected by succession in the head of the department in which he serves, whose duties shall be particularly those implied by his title and in general the enforcement of all the requirements of this amendment and the act which it amends. That said Inspector of Railway Locomotives and Rights of Way may be removed from office for malfeasance or incompetency; that his salary, payable monthly, be fixed at $1,800 per annum with necessary expenses.

Section 21. That the State Game, Fish and Forestry Warden shall appoint a special deputy Forestry warden whose title shall be Field Supervisor of Forestry, who shall have served at least ten years in practical lumbering or forestry employ, or have taken at least a two-years course in a recognized school of technical forestry and served five years in practical lumbering or forestry employ, whose term of service shall not be effected by succession in the head of the department in which he serves, whose duties shall be particularly those implied by his title and in general the enforcement of all the requirements of this amendment and the act which it amends. That said Field Supervisor of Forestry may be removed from office for malfeasance or incompetency; that his salary, payable monthly, be fixed at $1,800 per annum, with necessary expenses.

Several bodies, never identified, were taken from these ruins.

FOREST FIRE MISCELLANY

FOREST FIRE MISCELLANY.

The Fire Bug and the East Wind.

E. T. ALLEN.

(In American Forestry Magazine.)

"No, I'll not burn my slash this spring,"
  The moss-back logger said,
"I'll trust to God and luck again;
  Expense is what I dread."

"It's time to hit the trail again,"
  The careless camper said,
And left his little fire ablaze;
  Within its leafy bed.

"I'll light another cigarette,"
  The idle loafer said,
And chucked his old snipe in the brush
  One end still glowing red.

"Let's punch the screen out of the stack,"
  The donkey fireman said,
And so he did and all the sparks
  Sailed blithely overhead.

"Come on, we'll dump our ashes now,"
  The railroad trainmen said.
The train soon fanned them far and wide
  As on its way it sped.

"Good time to fire my slashing now,"
  The thrifty rancher said,
And touched it off without a thought
  Of how far it might spread.

"I think I'll blow an hour or two,"
  The restless east wind said,
Then liked it so he changed his mind
  And blew a week instead.

"Millions in lives and timber lost,"
  The newspapers next said.
What made those fires all start at once,
  We wondered as we read.

"It wasn't us, it was that wind,"
  The fools in chorus said.
So they're alive and loose this year
  ——We hope the wind is dead.

Thus Forest Fires Devastate the Plateaus and Valleys of Michigan.

WHAT THOSE WHO OUGHT TO KNOW THINK OF THE FOREST SCOUTS.

To Hon. William R. Oates, State Game, Fish and Forestry Warden:

Theodore Roosevelt:

"I have found the information of your Forest Scout text book most interesting. My consideration is that the work in conservation is of prime importance."

A. C. Carton, Secretary Public Domain Commission and Commissioner of Immigration:

"I will be much pleased and always ready to assist in making this great movement a success in Michigan. Feel at liberty to 'draw on me' for any assistance I can render in connection with the Michigan Forest Scouts."

Gifford Pinchot, formerly U. S. Forester:

"I have your admirable text book for the Michigan Forest Scouts. I am today writing the editorial secretary, Boy Scouts of America, endorsing the proposal that the national organization take up the same work in the several other forest states, along the lines exploited by your department. Let me know if I can help in any way.

"You must realize that the enlistment of boys of the State in this work can not solve the fire problem. Michigan, I am sorry to say, is far behind most of the States in handling this question. The enlistment of the Michigan Forest Scouts must not be allowed to stand in the way of an effective body of fire fighters employed by the State."

"By far the best work in fire fighting now done in the United States is that of the National Forest Service. I recommend strongly the organization of work along the same lines for the State of Michigan. Such a service should stand on its own feet, and should not be merged in any organization with work other than that of forestry to look after. The forest question is far too important not to have an organization of its own."

Very sincerely yours,

GIFFORD PINCHOT.

Douglas Mallock, associate editor, AMERICAN LUMBERMAN:

"The Michigan Forest Scouts constitutes an unique organization and the working out of an unique idea, an organization which I have every reason to believe will be of tremendous value to the state of Michigan in aiding in the protection of its forests against fire."

Jefferson Butler, Secretary Michigan Audubon society:

"You are helping in getting the State and public to make a step forward."

William B. Piper, Supervisor Federal Forest Reserve of Michigan:

"I am in hearty sympathy with the movement which you are undertaking and perfecting. I wish you every success in this splendid enterprise, the educational value of which will be alone worth much in dollars to the State of Michigan, if the work is given the general support which will continue it."

Thomas B. Wyman, Secretary-Forester, Northern Protective association:

"I shall be happy to assist the Scout movement in every possible way."

Chas. F. Hickok, Warden, Forest Fire Protective department, M. H. M. A.:

"The Forest Scout movement is a splendid conception. It is a movement in which I am very much interested. I am sure the boys will be known for their work in the near future."

Henry Ford, Detroit:

"I am deeply interested in this particular innovation in your department—the Michigan Forest Scouts."

Henry S. Graves, United States Forester:

"I appreciate the honor of membership in the Michigan Forest Scouts."

Carl E. Schmidt, Detroit:

"Please secure for the Michigan Forest Scouts at Walhalla, complete dress and field accoutrements and send me statement covering expense."

SPECIMEN OF THE WILD LIFE OUR FORESTS CONSERVE.

This picture, with an accompanying story, won a "Mershon" medal for prize text on bird life.

SPORTSMEN, SETTLERS

AND CAMPERS

PUT OUT SMALL FIRES

AND THERE WILL BE NO LARGE ONES

Human Life and Property may be Saved by your Timely Action

Fire from a Pipe, Cigar or Cigarette

OR A

LIGHTED MATCH

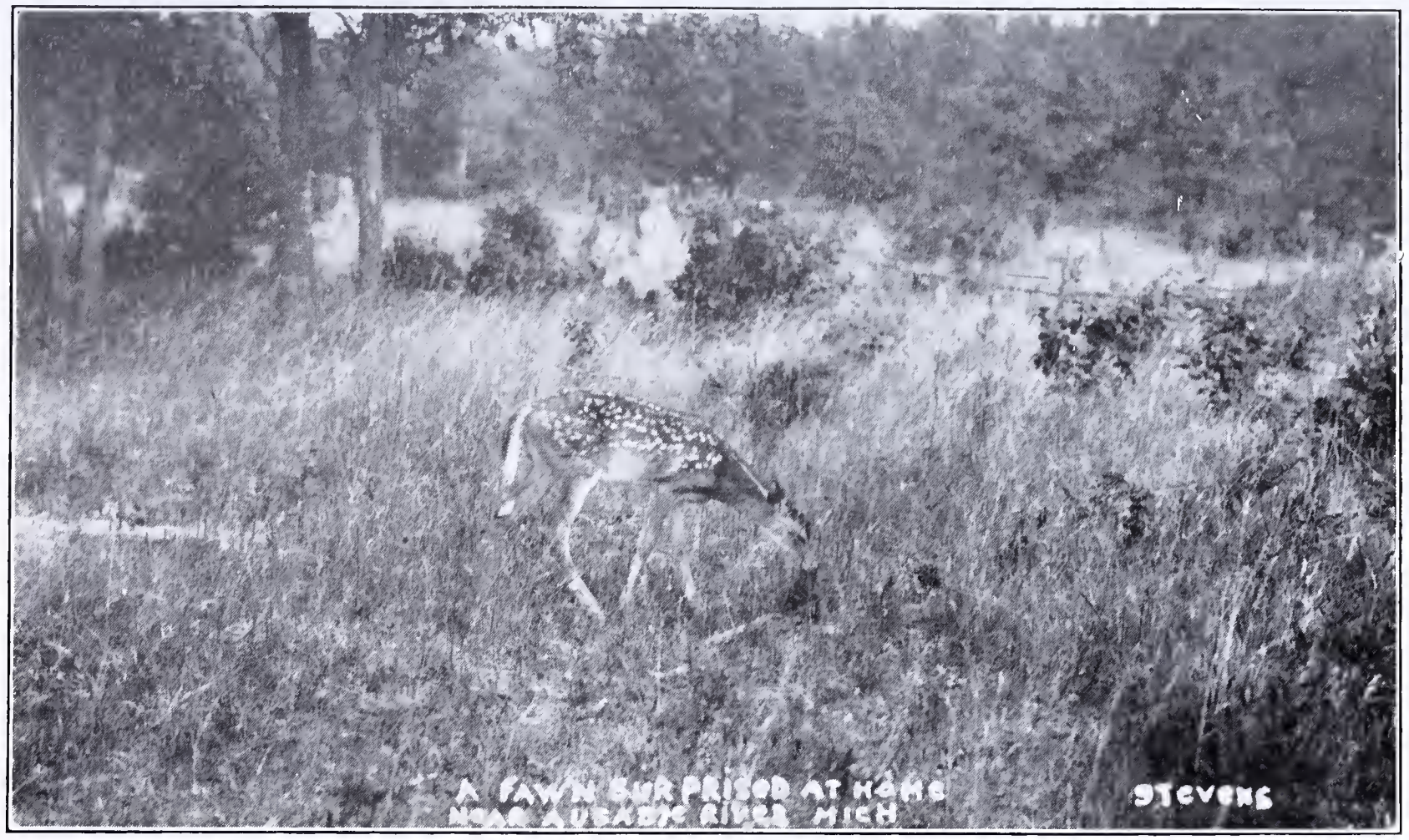
Carelessly thrown away is

DANGEROUS

For help, call on the Supervisor, Fire Warden,

Deputy Game, Fish and Forestry Warden or

WILLIAM R. OATES
State Game, Fish and Forestry Warden
LANSING, MICH.



It is a misdemeanor to kill a fawn in the "spotted coat," but the photographer braved the law and "shot" this one.

L. L. Wright, Supt., Public Instruction:

Your organization has my heartiest endorsement and I desire to co-operate in the Forest Scout movement in all possible ways.

W. B. Mershon, Saginaw: Member State Board of Tax Commissioners: This is the best Home Missionary work exploited on this continent."

The Scout put out a little blaze,
  Inconsequental, THEN.
Say, you're not dense? The consequence
Dwells in what "MIGHT HAVE BEEN."

Every lumberman, every railway official in the forest district of Michigan favors the department plans for:

(1) MICHIGAN FOREST SCOUTS.

(2) PRACTICAL INSPECTION OF RAILWAY LOCOMOTIVES AND RIGHTS OF WAY.

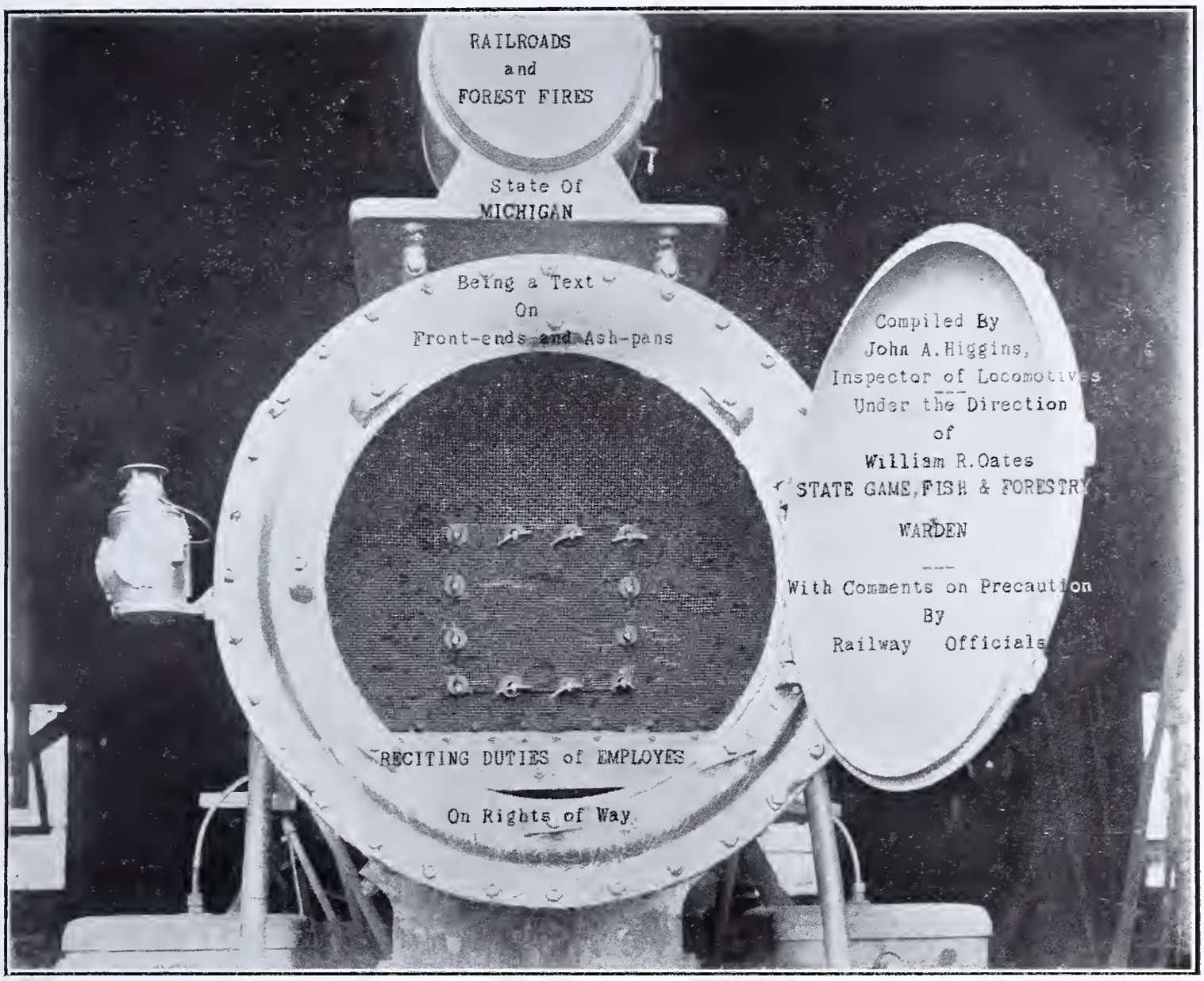
$20,000,000 YEARLY FROM ONE FOREST.

The Forest of Campiègne, France, though a realm of beauty and enchantment to its lovers, is yet made by the State to yield an annual income of one hundred million francs ($20,000,000), writes Lillie Hamilton French in the *Century*. For this purpose it appoints seven *brigadiers* and twenty-seven *gardes-cantonniers*. The cantonniers look after the roads, the guards protect the rights rented to the sportsman and lumber merchant—the two great clients from whom these revenues are derived two hundred thousand francs a year being paid by the sportsman and eight hundred thousand francs by the lumber-man. The guards must also see that these two groups of clients never encroach on each other's rights, for though the sportsman may hunt on the wood-merchant's land, he cannot carry from it a splinter of green wood; while the wood-merchant would have a suit brought against him if he were to pocket so much as a rabbit found burrowing under one of his dearly purchased trees. And some of these trunks *are* dear, one of oak frequently costing him a thousand francs.

So far as the question of revenue is concerned, *la chasse* is made to designate every right, whether of fishing or hunting, which is rented to the sportsman. As a diversion, however, it means to its votaries two distinct kinds of hunting, the most important and picturesque being the *chasse à courre,* or hunt by pursuit, and in whatever direction the stag may lead. This takes place twice a week after the cold has set in, and always on horseback, with a following of hounds. This *chasse à courre* is never rented except to a single person and usually for six years, at an annual rate of 17,300 francs ($3,460). When the lessee is frugal, as he occasionally is, he sublets it.

On the other hand, the *chasse à tir* or hunt with fowling-pieces, is divided into twenty-five "lots," and rented for various prices from twenty francs or more, and includes the right to shoot, within certain limits, hare, rabbits, doe, pheasants, and wild birds. The opening and closing of the chasse is decided every year by the *prefet,* as our Thanksgiving day is by our President though it is generally on the last Sunday of August that one hears the report of the first authorized gun. The event is one of almost national importance, chronicled by every newspaper in the land, and discussed by every Frenchman, high or low, rich or poor.

RAILWAY



WILLIAM R. OATES,
State Game, Fish and Forestry Warden.
DAVID R. JONES,
Chief Deputy Warden.

SUB-DIVISION

TEXT BY J. H. McGILLIVRAY.

JOHN A. HIGGINS.
Acting Inspector of Railway Locomotives and Rights of Way.

RAILROADS and FOREST FIRES.

INTRODUCTION.

The purposes of this text are:

To stimulate the interest of officials and all subordinate employes of railways in the matter of FOREST FIRE PREVENTION.

To present to railway officials the attitude of the State in regard to its laws regulating their conduct in precautionary measures against forest fires.

To prescribe, by suggestion, beneficial mechanism for locomotive equipment, based on the observation and experience of State inspectors.

To acquaint the several railways of the work and attitude of each other in fire protection methods.

To acquaint the general public with the true attitude of the railways in regard to forest fires—demonstrating that, IT, the general public, is often an "accomplice before the fact" in disastrous fires for which the railways may be held wholly culpable.

WILLIAM R. OATES,
State Game, Fish and Forestry Warden.

THE PUNCHED HOLE.

There was a time, not so very long ago, when the engineer of a locomotive was the grand Poobah of the road. He was King in the eyes of other subordinate employes and even the big officials took "back talk" from "Old-stage Throttlers."

"We were haulin' *half the earth* on *flat* wheels, but I put my boots to the fireman, stove a hole in her draft wall an' brought her in," might be the swaggering verbal report at the division's end when the Poobah registered.

Now, this isn't saying anything in general against the old-time engineer, for he was altogether an alright man—that was just a way he had and it showed a good spirit, if the fireman didn't object, but a sad lack of scientific knowledge in regard to the "draft wall," by which he meant the mesh in the front-end.

As a matter of fact, repeated experiments have demonstrated that an ordinary hole, such as would be punched by a crow-bar, say two inches in diameter, punched in the mesh, not only does not increase the draft but actually lessens it.

The punched hole will not accommodate the whole volume of gaseous air which ordinarily passes through the mesh, while it creates an accentuated local draught which deflects the side air. In other words, the swifter flow in line with the puncture retards the side air, swirling it in an eddy which checks the air behind it, until such time as the greater part of it is absorbed by the accentuated current and finds egress through the punched hole.

You have read of the guest in the Pullman berth who secured relief from suffocation by raising the car window? In the morning he found that the window was double and that his action in raising the inner window did not effect his air supply at all.

So, we say to the engineer of today, who is fully as good a fellow as the "old-timer",—*don't punch a hole in your "draft wall."* It is only a fallacy that it helps your engine to steam.

But it is no fallacy that cinders may escape through a punched hole which may set fires that may cost thousands of dollars in damage; perhaps to the forests; perhaps to the property of your employer. AND, the superintendents of all railways now operating in Michigan have issued orders that any employe so interfering with the front-end mesh is to be summarily discharged.

IMPROVED "M. M." FRONT END.

ACCEPTED AS ONE STYLE OF STANDARD BY STATE OF MICHIGAN.

W. H. Nuttall, Superintendent Motive Power, Manistee & Northeastern Railway Company recommends for accepted state standard of front end: Blue print illustrates the internal arrangement of the smoke box. The partitions A, B, C and D and the spark screen H and J separates it into three chambers, which are designated a, b, and c. Chamber "a" receives the gases as they leave the boiler tubes. From chamber "a" the gases flow thru the contracted passage between "C" and "K" into chamber "b." The sparks are deflected upward from their straight course by the plate "D" and thrown against the screen "H J." They are partly broken by impact against the deflecting plate and the screen and the small pieces pass thru the latter and out through the stack and the larger pieces are deflected back and fall down toward the apron, most of them into the high velocity current of gas which again hurls them against the deflecting plate and the screen. Eventually, practically all of the cinders pass through the stack. The purpose of all these fittings in the smoke box is to reduce the size of sparks before ejectment and as they mingle with the exhaust steam from the steam cylinders of the locomotive, they are extinguished before leaving the top of the stack.

See cuts, next pages, over.

TO MASTER MECHANICS
and
SUPERINTENDENTS OF MOTIVE POWER.

You know considerable about an engine and its ashpan and the mesh in the front-end. You know lots more, perhaps, than we do about that engine in its entirety, but we have made an especial study of the ashpan and mesh and their relation to forest fires.

We have asked you what you know about the ashpan and mesh and we have asked a great many other railway men what they know about them. If those interrogated have told us what they know then we know what you know, plus what the other fellow told us, plus what we have found out by other personal investigation.

Presuming on this gathered knowledge, we desire to tell you some of the things we have learned and to submit suggestive advice.

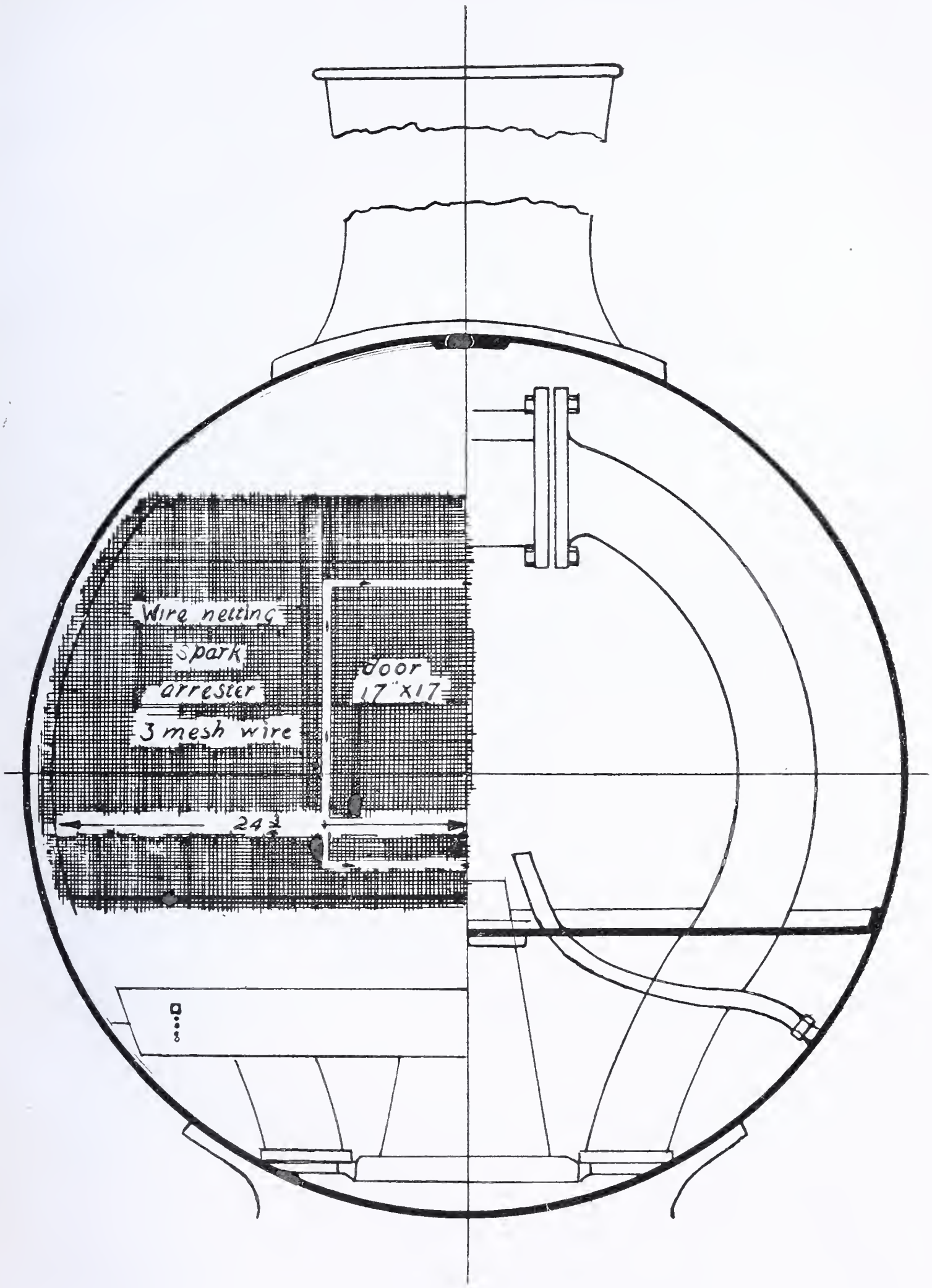
We have learned that railway engines set at least 20-percent of the fires which destroy our forests.

Contrary to general opinion, we have learned that the major portion of such fires are the result of live cinders which escape from the front-end of locomotives, "properly equipped" with Master Mechanics front and ashpan with all mesh in what has until this year been recognized as legal condition—that the remaining portion of "railway" fires—about 20-percent—are caused by live cinders which escape from *defective* front-ends and ashpans.

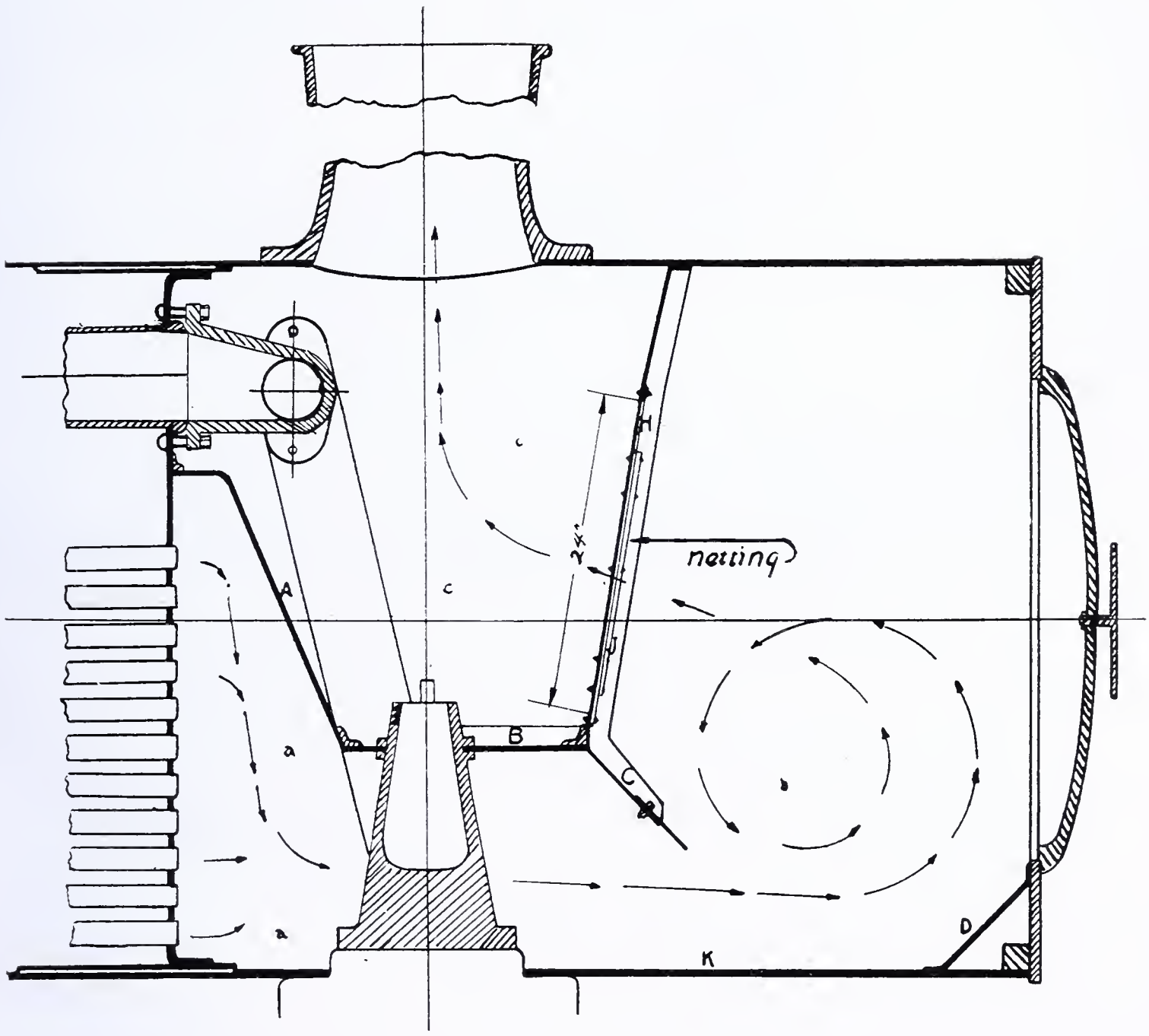
TWENTY PERCENT TO BLAME.

Our deduction is that 80-percent of the locomotives in service with regulation equipment, set 80-percent of the 20-percent of all forest fires, or that portion attributed to railways, and that, *morally,* the railways are but 20-percent of the "20-percent" to blame.

Note: The general reader must not construe this text to be an exposition of the railway side of the matter under consideration, nor should this text be used in courts to sustain railway contentions. If we seek to do the railways justice, we adhere to facts and avoid favor—we set against our favoring verbiage the picture of the destruction of Oscoda and Au Sable, page 13, maintaining that the catastrophe was the result of sparks thrown from locomotives, though, to the best of our knowledge, the locomotives in question were "properly" equipped.



Front view—Accepted by the Forestry Department, State of Michigan as Standard "front end" ·Mesh: 3-16 in. square opening No. 10 crimped wire. See page 35 and side view, next page.



Side view—Accepted by the Forestry Department, State of Michigan as Standard "front end" Mesh: 3-16 in. square opening No. 10 crimped wire. See page 35 and front view, preceding page.

We find fault with the accepted equipment of locomotives, a matter which we will consider later.

WE DIRECT YOUR ATTENTION NOW, TO:

Defective mesh, whether burned out or improperly installed. Defective ashpans; burned out or improperly constructed. Burned or damaged baffle plates.

A mesh is only as cinder protective as the largest hole in it.

MORAL LIABILITY AND THE FRONT-END MESH.

If the mesh has been bent or warped between the keys of the man-hole; if a few squares of the mesh have been burned out in one little spot; if the edge of the mesh, through improper fastenings, to its walls, has sagged or warped—if an engine showing any of these conditions is allowed to continue in service without immediate repair, then, the employe or official, who, having knowledge of such condition, drives or allows such engine to be driven along the right of way, is not only amenable to the law, but is as morally guilty of arson as if he had gone in secret and set fire to his neighbor's home.

We have found that some roads made a practice of fastening the mesh in the front-end with lugs or keys. This is an unsatisfactory fastening, inasmuch as it is only a matter of a short time when the heated mesh will crimp between the lugs, affording holes through which dangerous cinders may escape. *We have found at the edges of mesh thus installed, orifices through which the inspector could thrust his arm.*

The material for the front-end mesh must be of such strength as to be stiff and not pliable, not less than No. 10 steel wire or equivalent.

In proper installation, the mesh should be set on angle irons, securely fastened to the walls of the barrel, as shown by the illustration on our sub-division title page.

Bolting the mesh to the angle bars should be carefully accomplished, with *limited* intervals between the bolts.

The man-hole may be fastened with keys, as it is in the center of the draught which has a continual tendency to hold it in place, but in no case should the keys be more than 8 inches apart, as the center of the cover might sag through the hole. This might cause the edges of the cover to turn back between the keys, exposing dangerous vents.

INSPECTION.

Inspection of front-ends, in round-house or elsewhere, should include the baffle plate which is liable to be overlooked on account of its secluded location. We have found that burned baffle plates have been responsible for the setting of forest fires.

There are so many things that can happen to a "slide," "hopper," or "dump" ashpan, which will allow of the strewing of fire along the right of way that rigid inspection should be given them on every possible occasion.

The engine crew will tell you that there is little danger from the contents of the ashpan—that it carries "dead" material. We maintain that any ashpan almost constantly contains live residue which under certain conditions may leak and cause fires. Else why do Master Mechanics take the trouble to run waste water from injectors in the pans, or steam jets from the pipes or boiler?

We note that one style of ashpan secures its draught from over the sides. The sides of this pan turn at right angle from the boiler. It turns again, upward, at the extreme edge, with an inch or more of marginal guard. We have observed that the rocking of the locomotive will at times expel live cinders over this pan side.

We ask that the marginal guard on such a pan be raised to a heighth of at least three inches, or equipped, as it is, with a protective screen.

Should the increased guard interfere with draught, then an extension of the straight angle from the boiler will overcome the trouble.

THE MECHANICAL STOKER.

We are told that there is a new appliance known as the "mechanical stoker" which does not necessitate the opening of the fire box door, except at long intervals; that it reduces the strain of constant contraction and expansion on the sheets and tubes of the boiler; that its use would obviate the cleaning of fires and ashpans on the road, thus eliminating the danger of forest fires from such procedure; that—of especial interest in overhead matters—its saving in coal in a short time pays its initial cost and the cost of installation.

We believe this purported improvement, like all purported improvements exploited, is worthy of investigation by officials of Michigan railways.

"OBSTRUCTED MESH," ONLY ONE CAUSE OF BAD STEAMING.

It is only a few years since the men in the cab assigned most of the bad steaming of locomotives to the front-end mesh. They were ignorant, for the most part, of the many other possible causes.

Of course, if the mesh becomes obstructed with clinkered cinders your engine will not steam well. But, if your mesh is free from such obstruction, look elsewhere for the cause.

As a general rule the true causes of defects in steaming are now found and remedied promptly and the engine is saved the bad character names connected with peppery English, which in old days were applied without stint to a locomotive which, initially, did not steam well.

When the front-end of an engine is opened the eye sees first the mesh with its intermittent shrouding of the draft passageway. The cabman, be he engineer or fireman, is unable to define the why of it, but the first suggestion that comes to his mind is that the draft is retarded by this mesh, so he just naturally wants it out of the way. He does not, perhaps, stop to consider that other engines, of the same pattern, with similar mesh are steaming without trouble.

As a matter of fact there are simple little shiftings of adjustment in other parts of the front-end that will cause bad steaming.

In investigating for the cause of bad steaming it should be determined that the exhaust pipe and nozzle are securely held in place, and that the nozzle is set exactly in line with the center of the smokestack.

The diameter of the nozzle should be such as to allow the exhausted steam to fill the stack as completely as possible.

If the exhaust jet fails to fill the stack, it will not produce the vacuum that is needed to employ a strong, well spread, draught on the fire.

A jet expanding beyond the limits of the smokestack also has disturbing effect on your fire and retards generation of steam.

The adjustment of the petticoat pipe, if it is in the equipment, is of importance in the matter of steaming. It should be determined that this pipe is in proper alignment.

The diaphram or deflector plate is also of importance in its adjustment. If the diaphram is set too low the draught will be stronger in the lower flues, and if set too high the draught will be stronger in the upper flues.

If the smokebox parts are kept in their proper position and the mesh netting is not obstructed by clinker cinders there should be little trouble in steaming; providing, that there are no leaks in joints of front castings, or smokebox door, or base, or steam pipes.

Now, *we are not attempting to display general knowledge of steaming, Mr. Cabman; but we do desire to direct your attention to other*

things than the mesh as an obstructor, for the mesh and its possibilities of allowing sparks to escape which may set forest fires is what particularly interests us.

DOES THE SMALL FIRE PREVENTIVE MESH IMPAIR A LOCOMOTIVE'S EFFICIENCY?

We realize that most railway officials who have immediate or general charge of motive power are anxious to make use of any mechanism that will lessen the danger of setting forest fires.

READ THIS:

We have talked with practically all of the officials in charge of motive power on the railways of Michigan and we have yet found none who have told us that they have experimented with a smaller mesh than that now in use on the Marquette & Southeastern, which is practically a 3/16 inch open hole. THAT IS, we have found none but Terry Turner, Master Mechanic in charge of power on the A. S. & N. W., a branch of the Detroit & Mackinac railway, with its shops at Au Sable.

The scapegoat in Terry's family was No. 5, a Brooks 28-ton locomotive, design of 1890. No. 5 was equipped with the regulation M. M. mesh. There was hardly 100 yards along her 60-odd miles of way that she did not set a fire during the fall of 1911. The A. S. & N. W. was then a line by itself and had no connection with the Detroit & Mackinac.

During the early dry weather in the spring of 1912, Forest Scouts, the school boy organization of auxiliary fire wardens, extinguished at least 100 incipient fires set by No. 5.

Terry took the scapegoat to the shops. He said unkind things about her and to her. in the presence of a state inspector. Then he talked her over with the inspector and H. K. Loud, one of the officials of the road.

They decided to try a smaller mesh. They installed one with a 1/8 inch hole. At the same time they extended the angle bars which held the mesh farther forward, so that it stood more horizontal.

THE RESULT WAS:

No. 5 set no more fires.

The efficiency of No. 5 was not impaired.

OUR QUERY IS: Has the smaller mesh really been tried out by the railways with the view of elmininating the casting of large, live, cinders from the stack, and, properly arranged will it impair the efficiency of an engine to an appreciable extent?

Forest fire refugees making the best of the worst.

HOW STEAM FLOWS.

When steam is generated in a locomotive engine, it rises to the top of the boiler and fills the dome and the rest of the steam space.

By opening the throttle, the steam is allowed to flow through the throttle valve into the standpipe, thence into the drypipe to the niggerhead in the smokebox, where it is divided and passes down each steam pipe and through the cored passages in the cylinders, where it is expanded, moving the pistons.

On the return stroke of the pistons, the valves uncover the ports where the steam previously entered and form a "right of way" between these ports and the exhaust ports; thence the flow proceeds through the exhaust channel in the cylinder saddle to the nozzle stand and out through the smokestack to the wide, wide world.

It is in its exit that the cinders, drawn through the mesh from the front-end by its preceding "cough," are shot high in the air, WHEN, if they are dead, as they should be, they alight on combustible material without damage; WHEN, if glowing as they should not be, they may ignite inflammable material on or adjacent to the right of way, often causing great property loss and sometimes loss of life.

A leak in the front-end—that is, an air leak—generally means that there is a continuous local fire in the cinders congregated there, and such condition generally results in a fire on or along side the right of way.

DUTIES of EMPLOYES

In Regard to

FOREST FIRES.

The prime purpose of this text is to draw the attention of all railway employes to forest fire preventive measures.

We believe that the general type of railway employe represents the highest order of intelligence found among skilled workingmen.

We regard him, however, as prone when on duty to consider himself, as he is too often considered, simply a factor in a big "time-making" machine.

The railway and its time schedule is only part of the big scheme of life.

The first consideration of all peoples should be consideration for the major good for all.

The railway employe is first, a man, second a citizen; he happens to be a railway employe.

It is as much the duty of a railway employe to halt his work to take preventive measures against destructive forest fires as it is the duty of the settler whose home it may destroy to do so.

Bear in mind that the settler would make the utmost effort needed to warn the trainman of a burned trestle or the broken rail ahead.

We want that the railway employes know that a brush flail will prove effective in beating out a grass fire.

We want that he shall know that sand and dirt are generally more effective weapons for forest fire fighting than water.

We want that he shall know that water-soaked sacks or blankets can be used to advantage in beating out ground fires.

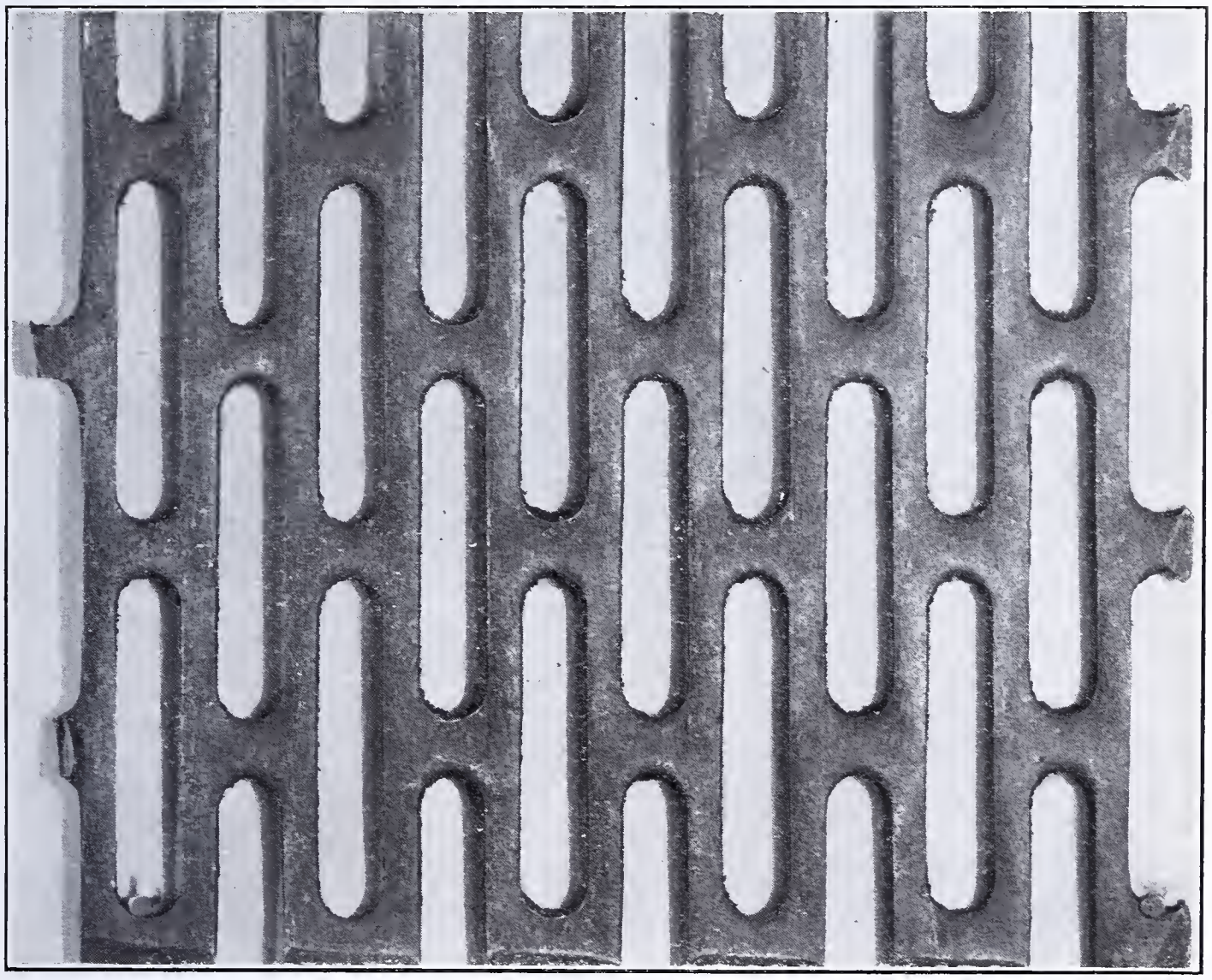
We want that he shall realize that he is morally as well as legally responsible for loss of life and property when such loss is the result of his inattention to a proper inspection of the fire risk condition of locomotives, or minor fires the danger of which he disregards.

Under the law, dry grasses on Railway rights of way should be burned at opportune times.

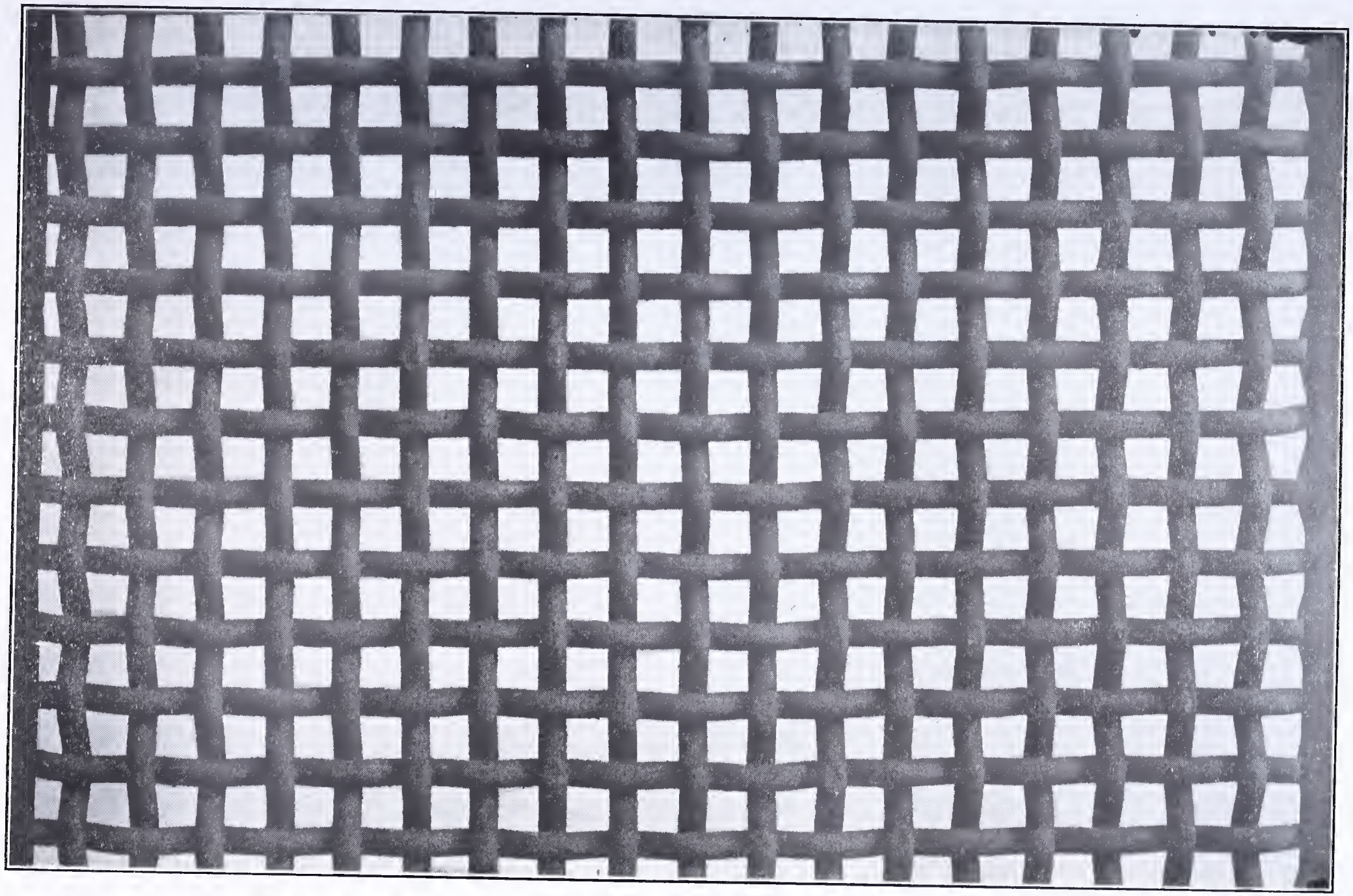
A fire-ball of waste or other material saturated with oil may be trailed by the section foreman's crew along the outer limits of the way. With a favorable wind the fire will be carried to the track where it will die for lack of ready fuel.

Parallel furrows should be plowed on either side of way when needed.

THE RIGHT KIND OF MESH.



Detroit & Mackinac Railway, spark arresting screen, perforated steel plate, 3-12—127 plus, accepted as "Standard" under Department Inspection.



Manistee and Northeastern Railway, spark arresting screen No. 10, steel wire, square mesh—3-16 accepted as standard under Department Inspection.

SOMETHING ABOUT ASHPANS.

BY T. J. HENNESSEY, DIVISION MASTER MECHANIC, MICHIGAN CENTRAL RY.

We have in use on the Michigan Central railway three different styles of ashpans.

The first is a hopper pan, and for the purpose of dumping the cinders, and emptying the pan, we have a slide in the bottom, which is made of cast iron and is not liable to warp. This slide is operated by an air cylinder on the rear of the pan, operated from the cab of the locomotive. This pan gives the best service. It has given us very little trouble, even in the coldest weather. The bottom of the pan is a casting, suitable for covering the hoppers on the bottom, with a steam-way cored in the sides and across the ends of it. The steam is connected with a pipe, which goes into this core in the casting, which keeps it from freezing. We have very seldom had these pans freeze up, even in the coldest weather in this northern country. On two or three occasions, they did freeze up, but upon investigating the matter with the engine crews who were in charge of engine, they admitted that it was their fault for not turning the steam on same to keep them from freezing.

In my opinion this is the best ashpan there is in service. We have the hoppers of these pans lined inside, with a space of about one inch between the lining and outside of pan. This prevents the fire from warping the pan, so that it is in good condition at all times. With proper care of these pans, keeping them close to the mudring, and seeing that the pistons in the air cylinders are in proper working condition to operate, I belive they are the best pans made and give us very little trouble maintaining them.

No. 2. We have another class of ashpan on our lighter engines, which has been in use for some years. The pan is equipped with hoppers, opening with levers connected inside the cab, so that the fireman may open and shut the pan from the cab. We have had some trouble with this pan, from the fact that the levers, etc., wear, causing some lost motion in the connections, and the pans are liable to get out of order so that they will not connect tight at the bottom, and quite frequently, have to be gone over to remedy this defect. In my opinion they are not as good an ashpan, nor as safe, as our hopper pans worked with a slide on the bottom operated by air.

No. 3. We have another ashpan on our 8-wheel engines, but there are very few of them left, as they are being discarded as fast as possible.

These pans are only on old engines that are liable to be taken out of service shortly. There is a damper in the front and back ends of the pan, and by leaving the damper open, the pans are liable to drop fire, but in order to prevent this, we put a panel of netting in the damper, which allows the pan to get the required amount of air when shut, and also prevents the fire dropping out.

Formerly these pans had to be cleaned out by the fireman getting underneath the engine with a hoe, but we have them now equipped with a blower, that is, an inch and one quarter (1¼″) pipe, connected with the cross section of pan, with three or four flat nozzles, to allow water or steam to blow the ashes and clinkers out of back end of pan. These pipes are connected with the back boiler head, and are blown out with hot water.

We first equipped these ashpans with slides in the bottom of pan, but it was impossible to keep the slides from warping. The slides were operated with a lever in the cab, and after a short time it was impossible to move them, so that they were discarded, and we equipped the pans with a blower. In order to clean the pan, the fireman turns on a force of water under boiler pressure, and it cleans the pan out.

This in a very crude way describes the ashpans that we have in use. I could describe them better to you by blueprints showing the blueprint of these pans but I do not believe that that will be necessary.

I consider the hopper pan that I described as No. 1 to be the best pan we have as we have had no trouble with it.

Our No. 2, as described above is a hopper pan the bottom of which opens and closes by a lever connected in the cab but as there are two hoppers in this pan it is a hard matter to keep them tight as one might be tight while the other would not close tight and thus allow fire to drop out. This pan I do not consider as safe a pan as the one described as No. 1.

No. 3 that I have described is not worth while taking the time to say any more about as this style of pan is only on our old engines which are obsolete and which are liable to be taken out of the service at any time.

As we have given the pan question considerable thought our experience shows that there is no pan as good as the No. 1 which I believe could be considered as standard on this road.

In the event that it becomes necessary to clean the fire on the road I have issued instructions to the enginemen that they must come to a stop and put out the hot coals, not leave them burning on the track. This, I consider a factor of danger and instructions have been issued by the Mechanical and Operating Departments covering this matter.

ONTONAGON RAILROAD COMPANY

O. R. R.

T. A. Green, Pres. and Gen. Mgr.
C. H. Worcester, Vice-President.

Ontonagon, Michigan, Nov. 9, 1912.

Mr. J. H. McGillivray, Deputy State Forest Warden, Oscoda, Mich.

Dear Sir:—Your valued letter of Nov. 7th is at hand. The writer whom you have addressed on the subject of state work in forest fire prevention in regard to railways, is President of the Northern Forest Protective Association. You will, therefore, gather that I am taking an unusual amount of interest in the subject of protecting our forests and people from forest fires. I am also interested in the lumber business pretty heavily and have within recent years suffered very materially by losses from fire. I confess that I am at a loss to know exactly what to say to you. The problem is much larger than people think it is. It is ridiculous to think that the railways set fires purposely, or that they desire their employes to do so. About all one can do with the matter at present is to have the state inspector of locomotives see that the screens and ash pans are all in good shape, and the railways, so far as possible, are taken care of. It is not possible to plow a furrow down the sides of every railway right-of-way, because where a new railroad has gone in and the stumps are still green the cost will be tremendous. It is possible that something might be done by keeping tab on the locations where fire is set most by certain railroads. Places where certain locomotives have excessive work to do throw about their sparks worse than they do at other places. If these places could be picked out and cleaned up the chances are that not many fires would occur along the general railroad routes. I feel quite certain that there is no question but what the railroads are very anxious to co-operate with you and with the owners of timberlands, to preserve them. They, of course, must be approached in a business like way and no ill-feeling should grow up between your department and the railroads, and if your field men use the proper amount of tact there ought to be no occasion for such feeling. I will be glad to do anything I can to co-operate with you at any time.

Yours very truly,
T. A. GREEN, Gen. Mgr.

Complete report of inspection of entire forest milage of this road and repeated inspection of front ends and ashpans of all locomotives in its service, filed with Game, Fish and Forestry Department by John A. Higgins, acting as Inspector of Locomotives and Rights of Way.

CHICAGO & NORTH WESTERN RAILWAY CO.

Kaukauna, Wis., Nov. 11, 1912.

Mr. J. H. McGillivray, Deputy State Forestry Warden, Oscoda, Mich.

Dear Sir:—I have your letter under date of Nov. 7th, which refers to State Inspection of Locomotives and Right of Ways, asking for some suggestions for state procedure in regard to forest fire prevention. Beg to advise that in my opinion the Michigan Forest Scouts are doing splendid work and I know of little or nothing to add to your plans as already outlined; that you ask each Master Mechanic to furnish you with a copy of all instructions issued from time to time, regarding the prevention of fire; also get the same information from the Superintendent, with reference to any instructions issued to station men and section men on this same subject, and by publishing these instructions it will show what is being done by the railroads.

Personally, I know that railroads are doing everything in their power to prevent the setting of fires; it is for their interest to do so; that fire claims are expensive and very troublesome at times to adjust and no railroad will allow its men in charge to become careless; at least, the General Officials are after the subordinate officers constantly on this subject.

Yours truly,
F. SLATER.
M. M.

PRINCIPAL THOROUGHFARE OF OSCODA, FOLLOWING FOREST FIRES, JULY, 1911.

A score of persons lost their lives as the result of forest fires which razed this town.

WHAT RAILWAY MEN THINK AND DO IN REGARD TO FOREST FIRE RISK.

Detroit & Mackinac Railway Company.

FOREST FIRE PROTECTION, FROM THE RAILROAD STANDPOINT.

Delivered at Joint Conservation Congress, on call of A. C. Carton, Secretary Public Domain Commission, Capitol Hall, Lansing, June 12, 1912.

C. W. LUCE, EAST TAWAS, SUPT. D. & M. R. R.

Mr. Chairman, Ladies and Gentlemen:

A factor vital in the discussion and solution of reforestation problems is the elimination of all elements conducive to the starting of the forest fire and the application of every means possible tending its prevention.

The annual decrease in the quantity of Michigan's standing timber is apparent, and the outlook unless immediate action, individual and concerted, is taken, is discouraging. One of the chief causes of this decrease is the forest fire, and its prevalence and devastation during recent years illustrates its possibilities.

The railroad is one agency able to perform certain work tending to a putting out of fire already started before it has got beyond control and to an elimination of its causes. The actual institution of certain measures of late shows the railroad's willingness to do what it can in this regard.

In its inception the Detroit & Mackinac Railway was constructed along the Huron shores to take its part in caring for the forest products of north eastern Michigan. It has witnessed a gradual diminishing of the timber that was once so abundant.

In this discourse it is the writer's purpose to confine himself to what this road has done, first to prevent the starting of fire and second to overcome fire once started. Over most of its line, its track lies upon a right of way one hundred feet in width. This right of way is cleared of all brush and substantial undergrowth and presents nothing possible of ignition and fire-carrying qualities other than grass and ground growth.

Realizing, however, that fire once started in any ground growth sufficiently dry may run and set fire to adjoining or nearby timber, the road

some years ago adopted and put into execution a plan whereby such fire might be checked. It plowed two or three furrows, where possible, along and next to the fence on either side of the right of way. In nearly every instance this plan has been found effective and fire starting from locomotives or other causes has died within the right of way.

Another means of prevention results from work required of the section men. In the spring of each year these men burn over the right of way within their sections, and all combustible matter is destroyed. During such burning a continual watch is maintained in order that it may not spread to adjoining property. In no instance have these fires escaped without the limits of the railroad property.

In this connection it may be remarked that positive instructions issue to the section men that during continued dry weather no fires shall be set upon the right of way and that old ties and other rubbish shall not be burned.

Another method whereby fires are prevented lies in a special fire fighting apparatus with which some locomotives are equipped. This consists of a hose attached to the injector on the engine. Instructions to conductors and engineers are enforced to the effect that the operatives of trains so equipped shall stop and extinguish all fires on the right of way, and all fire off the right of way within reach of the hose. It is made the duty of the engineers and conductors of trains not so equipped, where it is not possible for them to put out the fire, to communicate with the office of the General Superintendent at the first telegraph station, and to notify such office of any fire on or near the right of way. The operatives of engines not so equipped, must also notify the conductor and engineer in charge of the first train they meet or pass which does carry the fire fighting apparatus, and the latter must, as soon as possible thereafter, ask for orders to go to the fire. Further it is required that the engineer and conductor, of a train first discovering fire, notify the first section foreman they meet, without regard as to upon whose section the fire may be, to go to the fire. They shall also notify other section crews in the vicinity of the fire to the same effect, providing in their judgment the conditions warrant it.

When the men in charge of trains so stopping to fight fires, are unable to put them out, the superiors shall immediately report such fact to the office of the General Superintendent. Dependent upon the conditions, large crews of employes may be then sent out and assembled at the place of the fire, and efforts made to check and kill the burning.

In numerous instances fires as above suggested, not only upon the railroad company's property, but also upon adjoining land have been extinguished by the train men and men employed on the section which, had they been allowed to run, would have resulted in inestimable damage.

Admittedly fires do originate at times directly from a locomotive, but it has been the writer's experience that fires of more frequent occurrence

and of greater magnitude find their origin in the clearing of land. in the actions of campers and tramps, and in other causes.

To illustrate, on the 14th day of October, 1908, the day preceding the great fire that swept over and devastated large portions of the counties in Northeastern Michigan, the writer was riding over one of the branch lines and noticed a fire a half mile distant from the track kindled by a farmer for the purpose of clearing land. He remarked to the fireman of the engine in which he was riding that if the farmer who had set the fire did not take some action to prevent its running, night would see much of the surrounding country burned over. Later in the day he saw the truth of this remark evidenced—the same fire, now beyond control, had spread over several hundred acres of second growth timber, and had entirely wiped it out.

Upon the questions involving fires originating in the vicinity of a railroad, that agency must needs say a word generally in the defensive. Railroads are commonly adjudged the primary cause of many fires for which they are in no wise responsible—sufficient merely that a locomotive has passed thru the locality where fire is burning. Were the same or similar precautions that are adopted and put into effect by Railroad Companies, and were similar action in connection with a fire once started, taken by others, there would be less destruction of property by fire than has been the case in the past, and the years to come would witness a far smaller annual loss.

Coal is the fuel used almost universally in the operation of locomotives, and so long as its use is necessitated it cannot be assured that they will be run without occasionally setting fire. Without detailing the mechanism, suffice to say that an engine must have a draught in order to obtain the energy required to propel it. The fires that are set are directly resultant upon those parts of the engine which make that draught possible.

The writer has been questioned as to whether or not a locomotive, properly equipped with modern appliances, could throw out a spark or cinder from its stack of a size sufficient to set a fire. He has answered that if all of the conditions were just right, it might.

Large sums of money are annually expended by the Michigan railroads in an endeavor to prevent fires and to minimize the damage that has heretofore resulted. Locomotives are equipped with the most modern and most approved appliances known to the engineering world to eliminate the fire setting causes.

All engines now carry a spark arrester thru which all smoke and sparks and cinders must pass before reaching the outer air. Frequent periodical inspections of these spark arresters are had and every effort is made to keep them in good condition and to repair or renew them when necessary. Inspections are made also at other times, as when it comes to the knowledge of the road that fires are burning in the vicinity of the track. At such times all engines passing the point of the fire

within several hours prior to its discovery are thoroughly examined before proceeding on another trip. If any defects are found, they are remedied immediately.

It is manifest that the Railroads of this State are exerting every possible effort tending to a prevention of fires which may start from locomotives, and, as before stated, if similar efforts were made and similar precautions were taken by individuals and corporations other than railroads, fires would be fewer and the consequent damage would be greatly minimized.

Outside of, but touching the subject allotted him, the writer would wish to take opportunity of giving brief expression to certain thoughts on the question of reforestation.

UNLESS FURTHER AND MORE DRASTIC MEASURES, NECESSARY TO THE SUCCESS OF WHAT HAS ALREADY BEEN ACCOMPLISHED, ARE TAKEN IN THE PREVENTION OF FOREST FIRES, THE MONEY EXPENDED IN SUCH WORK WILL HAVE BEEN PRACTICALLY THROWN AWAY.

MICHIGAN HAS A STATE GAME, FISH AND FIRE WARDEN, EMPOWERED TO APPOINT DEPUTIES. THE NUMBER HE MAY APPOINT IS NOTHING WHEN COMPARED WITH THE NUMBER THAT SHOULD BE ENGAGED IN THE WORK, TO MAKE IT OF ANY PRACTICAL BENEFIT IN LOOKING AFTER FIRES IN THE NORTHERN MICHIGAN. EVEN ONE MAN TO A COUNTY COULD NOT PERFORM THE DUTIES THAT SHOULD BE INCUMBENT UPON HIM IN THE WAY OF PREVENTING AND FIGHTING FIRES. TO PRESERVE THE PRESENT EXISTING FORESTS, AND TO MAKE REFORESTATION PROJECTS FEASIBLE, OPPOSITION TO THE EXPENDITURES OF LARGE SUMS OF MONEY TO PREVENT FIRES MUST NOT BE SUGGESTED.

The best methods to be employed to preserve our present forests and to make reforestation worth while may be expensive but they are practicable and assure the desired result. A fire break of not less than four rods in width should be cleared around every section or fractional part of a section and should be plowed and kept clear of any inflammable matter. During dry weather a sufficiently large body of men should be employed to properly patrol these sections.

A law should be enacted and enforced prohibiting trespassing on State lands for any purpose whatever. The present existing laws should be amended so as to give to the wardens power to press all men in the vicinity into service to assist in putting out fires, a refusal to act on the part of any one so called upon to be a criminal offense.

In conclusion, the writer would wish to strongly urge the great importance of immediate, concerted action. He would suggest some means of organization that would take measures to prevent the setting of fires and to extinguish fires once started. He would have all persons in interest, parties to such an organization. He would see the question

Two thousand persons were rendered homeless by the forest fire which destroyed this city.

agitated, and would recommend the employing of many persons for that if for no other purpose. Unless some action is taken the same annual fires and consequent loss may be anticipated.

REPORT OF MASTER MECHANIC H. T. THOMAS, DETROIT & MACKINAC RAILWAY, TO JOHN M. HIGGINS, ACTING AS INSPECTOR OF RAILWAY LOCOMOTIVES AND RIGHTS OF WAY:

"The internal arrangement of front end of our engines is Master Mechanic standard. We are using perforated plates in these front ends. with 3/16″ x 1¼″ openings.

"All openings in ashpans are covered by perforated plate, same size openings as in front end, or steel wire netting with 3 x 3 mesh No. 9 wire.

"During dry weather *all* freight engines are equipped with fire hose and all enginemen and trainmen on freight runs have instructions to stop and put out any fires found along the right of way or within reasonable reach.

"The ashpans and front end perforated plates are inspected on all engines during the dry season at end of each trip. If anything is found wrong it is promptly repaired."

Complete report of inspection of entire forest mileage of this road and repeated inspection of front ends and ashpans of every engine in its service, filed with Game, Fish and Forestry Department by John M. Higgins, acting as Inspector of Railway Locomotives and Rights of Way.

MICHIGAN CENTRAL RAILWAY.

Bay City, Mich., Oct. 9, 1912.

M. C. Coyle, Division Superintendent: "It occurs to me that the Wardens and Forest Scouts should pay particular attention to the settlers. From my observations along the line in the timber country adjacent to the Mackinaw Division of the M. C. R. R. I have found that many of the fires and some large ones were caused through the carelessness or indifference of settlers in starting fires adjacent to timber and I am satisfied from my observations that if this matter were taken up with the settlers a large amount of timber could be saved.

"The Wardens and Scouts, in my opinion, should be so distributed so that they can cover the major portion of the timber lands adjacent

to the railroads and farm lands. I think also that the settlers and farmers adjacent to timber lands should be interviewed and their co-operation sought in the same manner that the co-operation of the railroads has been asked for. I think by doing this many fires could be obviated."

MICHIGAN CENTRAL RAILROAD COMPANY.

OFFICE OF DIVISION MASTER MECHANIC.

West Bay City, Mich., Mar. 11, 1912.
File L-39.

Mr. J. A. Higgins, Inspector of Railroad Locomotives and Right of Way.

Dear Sir:—"I enclose you copies of notices we have issued from time to time last year, for your information.

I also enclose you Drawing No. 4159-B, Section 1, showing details of applying our spark arrestors and equipment in front ends of engines.

This, I consider, as good a spark arrestor as I know of. This is our standard spark arrestor for the Michigan Central, and is used on all our engines. The netting is 2½ x 2½ mesh to the square inch, No. 11 wire gauge, which, I believe, is as small as can be used to advantage in order to give engines the proper draft and make them serviceable engines.

Our engines will throw some sparks, and I do not believe it possible to equip an engine so that she will not throw any sparks, and still have her a serviceable engine, but we claim that owing to the size of the netting, any sparks thrown from the stack, are so small and contain such a small amount of heat, that by the time they would strike the ground, the liability of them setting fire, is very small. This is an approved appliance, which is used by some of the best railroads in the United States and Canada.

In addition to this drawing of the front end, I expect to be able to furnish you a drawing of the ashpans on our engines. I have none in my office at present, but I think I can get some, and will send you one later on. These prints show the fully improved ashpan, with netting over all openings to prevent fire dropping from the pan while on the road.

I would also advise you that on the logging branches, in the fire zone, we equip our engines with 50 feet of fire hose, which is attached to the feed pipe from the injector, and which can throw a stream of water from 60 to 90 feet. This can be adjusted and applied in a minute or two, water being supplied from the tank of engine. We consider this a very good protection, as in case of a small fire being discovered in the timber region, water can be turned on and fire extinguished, as all our enginemen are instructed to be very careful, and whenever possible to put fires out, and avoid setting fires.

We also have a reliable fire inspector during the dry weather, up in

the fire zone, whose duty it is to watch this matter closely, and see that all ashpans on engines are in good shape on the road, and appliances in front ends of engines, in good condition, and that no unusual amount of sparks is emitted from the stacks.

In case he finds any defects, he orders the engine repaired at once, and see that it is done before engine is put back in service.

The netting in front ends and the ashpans on engines are examined thoroughly after each trip, and if any defects are found, same are repaired before engine is allowed to go out again.

These instructions are lived up to fully and to the letter, and I believe, with carrying out these instructions, and with the spark arrestors we have on engines kept in good condition, together with the other precautions we have taken, that we have eliminated the possibility of fire as far as is possible to do so.

I trust this will give you all the information necessary to show that we are doing everything possible and will continue to do so. I would be glad to have you examine our engines any place you might find them, and I think you will find them as I have represented them to be."

T. J. HENNESSEY,
Division Master Mechanic.

MICHIGAN CENTRAL RAILROAD CO.

NOTICE.

No. 631. Bay City, April 26th, 1912.

To all concerned.

Now that the dry season is approaching, all concerned must begin at once to examine stack nettings and ash pans of the engines under their charge. These examinations must be made daily and the reports on the weekly blank must be sent to me promptly at the end of each week.

These reports have not been made during the winter months, but you will understand that the matter is important and will be checked up closely from now on.

T. J. HENNESSEY,
Division Master Mechanic.

No. 629. Bay City, W. S., Apr. 26, 1912.

To Engineers and Firemen.

Now that the dry season is commencing, it will be necessary that particular attention is paid to the emitting of sparks from stacks and ashpans of locomotives. Engineers will be very particular in working engines, and not slip them close to any combustible material, and any

time you notice any undue amount of sparks coming from the stacks, you will make an examination and report same immediately. The greatest care must be exercised to avoid the possibility of setting fires, and report engines whenever necessary on account of an undue amount of sparks coming from stacks. This matter is very important and must be watched closely.

T. J. HENNESSEY,
Division Master Mechanic.

Bay City, W. S., Mich., May 7th, 1912.
Reissued July 12, 1912.

Mr. W. H. Brigham,
Mr. G. A. Holden,
Mr. J. F. Conlogue,
Mr. C. Wedding,
Roundhouse Foremen.

Gentlemen:—

It will be but a short time when dry weather will come and with it will be the necessity for every possible precaution against damage by fire.

One of the most prolific causes for such damage, is a defective ashpan, it is therefore absolutely necessary that ashpans be placed in first class condition, not only must the pans be inspected and repaired if necessary, but the apparatus which operates the slides or hoppers must likewise be attended to and known to be in a condition to perform the work required of it. Cylinder packing leathers, piston rod packings on slide pans must be taken care of at once, likewise the levers on the hopper bottom pacs must be overhauled where much is found to be required. Nettings in front ends must receive more than the usual attention, in fact everything pertaining to locomotives, which may in any way permit or restrain the dropping of fire along the right of way, must receive immediate and energetic attention.

Shops, round houses and adjacent material and oil buildings must be thoroughly gone over and cleaned up. All refuse, such as old waste, burlap, overalls, in fact any refuse that is combustible must be accumulated and destroyed.

Fire fighting apparatus must be known to be in first class condition and ready for immediate use.

The time to look after such matters is now, and I will be pleased to know that it has been done.

T. J. HENNESSEY,
Division Master Mechanic.

Showing litter along logging and passenger railway right of way. There are hundreds of miles in like condition in Michigan.,

Bay City, May 9th, 1912.

No. 632.

To Enginemen.

Posted at Bulletin Boards. Date, May 9th. Time.....

We have received a report of an engine dumping fire on the Bay City Div. and damaging bridge to the extent of $600.00, also have a report of bridge found burning on the Mackinaw Div. yesterday, evidently caused by engine dropping fire.

Your attention is called to these cases, for the purpose of showing you the necessity of more care being taken in this matter, as the damage is liable to be very serious.

Enginemen will be very careful about shaking hot coals from fireboxes between stations. No doubt you all understand that ashpans must not be left open while running, from the instructions previously issued, but I am calling your attention to the matter again.

T. J. HENNESSEY,
Division Master Mechanic.

Detroit, Mich., May 20th, 1912.

E. D. BRONNER,
Sup't Motive Power.

73-Fire precautions.

Loco. Dept.
Circular No. 394.

Mr. W. H. Flynn,
Mr. A. Link,
Mr. M. E. Sherwood,
Mr. E. R. Webb,
Mr. T. J. Hennessey,
Div. Master Mechanics.

Dear Sir:—

Attached you will find copy of letters from Mr. Bronner, General Manager and Mr. Bernet, Vice President, advising that under laws of the states of Indiana and Ohio railroads are held responsible for all fires set by locomotives whether employes are found negligent or not.

Instructions have already been sent out that all locomotives so far as front ends, nettings, etc. should be carefully gone over.

You will please take this up at once with all shops and round houses and arrange to have front ends opened and inspected regularly, and if any defective netting is found be sure that it is removed at once. Also, it would be well to issue instructions to engineers and firemen that they should be satisfied that everything is all right when starting out, and see to it that dampers are closed while running over the road.

Would like to have you go over letters of General Manager and Vice

President and take up question with all concerned in a very thorough manner.

In this connection would like to have you issue the usual instructions about having everything picked up around the shops and round houses in order to prevent as far as possible any fires being started on grounds.

Please acknowledge receipt, sending me copy of instructions and notices issued.

CC—M. J. McAndrews,
W. H. Corbett,
J. F. Jennings,
Road Foremen of Engines.
E. D. Bronner, Gen'l Manager.
S. W. Brown, General Superintendent.

Yours truly,
T. J. BURNS,
Ass't to Sup't Motive Power.

Bay City, W. S., July 2, 1912.

No. 645.

To all Engineers, working on branches.

Please wire me each morning the condition of netting in the front ends and the ash pans.

T. J. HENNESSEY,
Division Master Mechanic.

Telegram to engineer who neglected one morning to wire report of condition of netting on front ends and ashpans as per order No. 645, preceding:

> "Richard Roe, Engineer, Grayling, Mich.
> Give cause for neglect to send report, order No. 645, this morning. Either forward report immediately with satisfactory excuse or consider yourself discharged from employ by this company.
> Signed: T. J. HENNESSEY,
> Div. Master Mechanic."

Detroit, Mich., Mar. 23rd, 1912.

73-Fire precautions.

Mr. T. J. Hennessey,
Div. Master Mechanic.

Dear Sir:—

Your file L-40 of the 21st, with copy of letter sent to Foremen and notices posted in round houses regarding fire precautions received this a. m.

By referring to Mr. Bronner's letter, copy of which was sent you, you

will note that special mention was made of various fire fighting facilities on your division. This refers especially to the fire hose carried on locomotives working on branches. Have these already been taken care of?

T. J. BURNS,
Ass't to Supt. Motive Power.

MICHIGAN CENTRAL RAILROAD COMPANY.

OFFICE OF THE DIV. SUPERINTENDENT.

Bay City, Mich., July 12th, 1911.

All Agents, and others concerned,
Saginaw & Mackinaw Divisions:

I quote below letter from the Chairman of the Board, Mr. H. B. Ledyard, to the General Manager, Mr. L'Hommedieu, calling for the greatest care to be exercised on the part of employees to prevent fires to the company's property, which is self-explanatory.

"In the present parched condition of the country lying along our lines, I think you had better issue instructions that the greatest care be exercised by engineers and other employees to prevent setting fires. The Superintendent of Motive Power should be instructed to examine carefully the fire apparatus at the different shops and to see that the same is in good condition, and test drills should be held as frequently as may be possible so as to know that we are in a position to take care of a fire, should one break out."

This is in accordance with my circular of May 13th, 1911. Will you please impress the employees under you with the importance of carefully looking after all fire fighting apparatus of every description, to see that it is in the best of order and ready for immediate use in case of emergency, and have them exercise every care to prevent destruction of Company's property by fire.

M. C. COYLE,
Div. Superintendent.

Bay City, Mich., May 13th, 1911.

No. 297. Bulletin Notice.

To all Train & Enginemen:

During dry weather, train and enginemen must use the utmost care to prevent fires, especially on logging branches. Ashpans should be kept closed as far as possible, and not cleaned out in the vicinity of lumber piles, logs or combustibles of any kind, and if it becomes necessary to clean them out on the road, you must see that fire is extinguished before leaving.

Netting in smoke stacks should be watched to see that the same is in

good order, and extreme precaution taken in every instance to prevent fires. In case fires are discovered by train and enginemen, the fact must be reported to this office at once. M. C. COYLE, Div. Supt.
Re-issue Bulletin No. 1,
May 16th, 1910.

Complete report of inspection of entire right of way and all locomotives, filed by acting State Inspector with Game, Fish and Forestry department.

Note:—This road keeps double plowed furrows on its right of way from the Straits of Mackinac to Bay City during the "dry-grass" periods.

CHICAGO, MILWAUKEE & ST. PAUL RAILWAY CO.

OFFICE OF ASSISTANT DISTRICT MASTER MECHANIC.

GREEN BAY, WIS.

Green Bay Wis., May 30th, 1912.

Mr. J. A. Higgins,
Inspector of R. R. Locomotives and Right of Way,
Manistee, Mich.

Dear Sir:—

I am sending you herewith Blue Prints as follows:

Print No. 13919 shows box type of front end arrangement applied to engines 102, 120, and 184 on this division. The principal claim for this arrangement of front end is that once in place it is most accessible for inspection, all small parts of the front end can be seen from all sides; another claim for this front end is that it can be fitted together much closer than any other type.

Print No. 10132C shows spark arrester as applied to top of stack of locomotive, and is at the present time on engines Nos. 510, 513, and 518 operating on the Wisconsin Valley Div. The standard front end arrangement is used on engines equipped with this hood, the hood being an extra precaution to prevent throwing off sparks.

Print No. 3664 shows our standard front end arrangement as used on all smaller type freight engines.

Print No. 10628C shows standard front end arrangement as used on consolidation type engines.

Prints Nos. 11539 and 11652C shows type of ashpan used on narrow fire box type of locomotive. The opening underneath the damper at both ends are covered with 3 x 2 mesh No. 12 netting in order to prevent sparks or clinkers from working out of pan when damper is open.

Prints Nos. 12408 and 12726C shows the "Q" type of hopper ashpan as used on the G-7 and C-2 type of locomotives. The draft for the G-7

Proper right of way, cleared of combustible debris in accordance with forestry law. Note the plowed furrows skirting fence on extremes of way.

pan is obtained through small holes punched in sides of pan and which are not large enough to permit the throwing out of ashes. The draft for the C-2 pan is obtained through openings left in pan between bottom of mud ring and top of ashpan, the lower edge of pan is flared out along lower edge of mud ring to prevent any cinders or ashes from working out of the pan.

Print No. 12847C shows application of sprinkler pipe which is applied to all locomotives and runs through ashpan in such a manner that ashes may be thoroughly wet down before dumping pan, or should the ashes start on fire in the pan they may readily be quenched by the use of the sprinkler pipe.

I also enclose copies of various instructions in the way of letters, bulletins, reports. etc., showing what precaution we are taking to prevent the setting of fires, and these papers I trust will give you a clear idea of how we are handling the matter. Yours truly,

F. S. RODGER,
A. D. M. M.

CHICAGO, MILWAUKEE & ST. PAUL RAILWAY CO.

Mr. W. Wratten, May 14th, 1912.
Dist. Master Mechanic,
Minneapolis, Minn.

Dear Sir:—

I have your report of May 11th in connection with a fire reported on bridge Q-1192 at Romona on the S. M. Division, April 5th, and note that it is claimed there were no defects in the ashpan or the fire appliances of the engine.

However, I wish to call your attention, as the season of dry and hot weather is close at hand, that a more vigorous effort be made to inspect and maintain ashpans in perfect condition.

See that the sprinkler pipes on every engine are in condition for use, and properly used, and have a thorough inspection made of each particular ashpan to see that there are no openings that would admit of the escape of fire. and if any such openings are found that they be repaired before the engine goes into service. Yours truly,

A. E. MANCHESTER,
Supt. Motive Power.

Messrs:
J. F. DeVoy,
J. J. Connors,
W. Alexander,
E. Z. Hermansader,
F. S. Rodger.

Note what I have said to Mr. Wratten and take the same action in your district.

CHICAGO, MILWAUKEE & ST. PAUL RAILWAY CO.

Copy. Green Bay, May 13, 1912.

Mr. F. S. Rodger,
Green Bay.

During the coming period when there is always more or less danger from fire being started by locomotives and from other causes, we should exercise our usual particular care to do everything we can to avoid damage to property. Please be very particular to have engines inspected daily and a record of the condition kept on file for reference as needed. I am sending you a copy of bulletin instructions and feel fully assured that you will cooperate with all concerned in doing everything possible in the interest of the service.

E. X. HASTINGS,
Superintendent.

CHICAGO, MILWAUKEE & ST. PAUL RAILWAY CO.

March 27th, 1912.

Mr. F. S. Rodger, Asst. Dist. Master Mechanic,
Green Bay Shops, Wis.

Dear Sir:—

I am handing you two linen copies of extracts from the forest fire laws of Michigan.

Please have these, and as many more as are necessary, posted in conspicuous places, and have an understanding with all of your men, including engineers who may be in service on branch lines and must of necessity look after the condition of their engines, to see that the requirements of the law are lived up to.

Yours truly,

A. E. MANCHESTER,
Supt. Motive Power.

201.

Green Bay Shops, Wis.,

F. J. PENFORD, R. H. F.,
Green Bay Shops, Wis.
F. M. HUBER, R. H. F.,
Channing, Mich.
All outside enginehouses:

Dear Sir:—

Referring to Mr. Manchester's letter of August 12th, 1912, in regard to examining each locomotive each time it leaves the division point.

I am sending you a memorandum book herewith in which to record your inspections. Make the record short and plain as you may be called on long afterwards to swear to it. Record *date, engine number* and

condition and *your name* on one line clear across book in the order mentioned, thus,

8-16-12—Engine No. 490 O. K.—John Jones, Inspector:

Your inspection will be to see that ashpan doors or slides close tightly, no holes around ashpan that will drop fire and to remove hand hold plates on smoke arch and examine netting either with a torch or swab. Remember that engine must be inspected every time it leaves and a defective engine should not be allowed to go out until it is repaired.

You will find the law relating to forest and marsh fires pasted on inside of cover of record book.

Yours truly,
F. S. RODGER,
A. D. M. M.

June 24th, 1912.

CIRCULAR LETTER NO. 333-I.

ASST. SUPTS. MOTIVE POWER,
MASTER MECHANICS,
MASTER CAR BUILDERS,
GENERAL FOREMEN,
ROUNDHOUSE FOREMEN,
CAR FOREMEN.

The season of the year is now with us when the instructions pertaining to the prevention of the fires must be given special consideration.

You will call the attention of all employes to the danger from fires at this season of the year. Instruct them to have all barrels filled with water and buckets ready for emergency; to have hose and other fire extinguishing appliances in good working order and ready for instant use.

All paper and rubbish must be kept cleaned up around the buildings, lumber yards, etc., and at all points where we have an accumulation of cars or other property.

Grass must be kept closely cut around property exposed to prairie or forest fires.

Employes should know where fire alarm boxes are located and how to use them.

Particular precaution must be taken during July 3rd, 4th and 5th. The buildings must be carefully watched. At all points where we have facilities for doing so, the premises must be thoroughly wetted down on these dates.

Yours truly,
A. E. MANCHESTER,
Supt. Motive Power.

M. J. L.
N. M. M. F. S. R.
F. R.
T. J. H.
G. E. C.

Copies sent to all points on Sup. Div.
Krug 6/27.

CHICAGO, MILWAUKEE & ST. PAUL RAILWAY CO.

OFFICE OF DIVISION SUPERINTENDENT.

Green Bay, May 13, 1912.

Mr. John A. Higgins,
Manistee, Mich.

Dear Sir:—

Complying with our understanding at time of your call at this office, we are sending to you copies of instructions which we have issued with reference to doing what we can to prevent annoyances from fire during the coming season. We have always tried to maintain service the same as we are now doing. I also enclose for your information a copy of letter to Mr. Wm. R. Oates, Chief Warden at Lansing, Mich. Please feel assured that we are always ready to do anything we can in the interest of the service in question.

Yours truly,
E. X. HASTINGS,
Superintendent.

Complete report of inspection of entire forest mileage of this road and repeated inspection of front ends and ashpans of all locomotives in its service, filed with Game, Fish and Forestry Department by John A. Higgins, acting as Inspector of Locomotives and Rights of Way.

MINNEAPOLIS, ST. PAUL & SAULT SAINTE MARIE RAILWAY COMPANY.

OFFICE OF MASTER MECHANIC.

Gladstone, Mich., Nov. 9, 1912.

Mr. J. H. McGillivray,
Deputy State Forestry Warden,
Oscoda, Mich.

Dear Sir:

We take pleasure in outlining for you our established policy relative to the prevention of forest fires.

About four years ago we started to perfect our organization relative to this matter. We experimented on the design of locomotives relative to the construction of ashpans and spark preventive front ends of the first year until we found standards which we adopted that have almost entirely eliminated the setting of fires. We have educated our enginemen to co-operate in this matter by giving them careful instructions how to operate the engines in their charge, calling their special atten-

tion to the several State laws of which they are each furnished a copy. We frequently issue bulletins that are posted at all terminal points, for enginemen during periods of dry weather, demanding of them extra care in making reports of fires observed along the right of way and extra precaution on their part while operating locomotives. We apply discipline when this is not done.

At all terminal points we have competent inspectors who open the front end doors of locomotives every time they arrive and inspect every part to ascertain if there is any possible chance for fire to escape, and a record of this inspection is accurately kept. When we have a report that a certain engine has set a fire and our inspector fails to find any defect the foreman and other officials of the department are called to assist in determining the cause of the fire.

Enginemen are instructed where they may dump ashpans while on the road and not to leave the place until all fire has been extinguished. If enginemen should be furnished with a supply of fine coal or coal with a mixture of bark or straw, they wet the coal thoroughly before using it. The throwing of any burning waste or clinker off of engine is absolutely forbidden.

Where fires are found by enginemen burning on right of way, trains are stopped and fire extinguished if possible and telegraph reports to the Superintendent are made at the first telegraph station. Also all fires, observed in sight of enginemen, whether on right of way or not are reported by wire at first telegraph station.

All switch engines are supplied with fifty feet of water hose always attached to injector pipe, and immediately on arrival at a fire can throw a one inch stream of water with a pressure of 150 pounds as long as the water in the tender lasts. This arrangement is of great value around docks and mill yards.

Attached are duplicate copies of three bulletins which will give an idea of our manner of keeping this important subject in the minds of our employes.

Yours truly,

SAM. SHEPARD,
Master Mechanic.

S/A

MINNEAPOLIS, ST. PAUL & SAULT SAINTE MARIE RAILWAY COMPANY.

OFFICE OF MASTER MECHANIC.

Gladstone, Mich., May 15, 1912.

Mr. J. A. Higgins, Inspector of Locomotives and Rights of Way:—
Dear Sir:

The roundhouse foreman at Gladstone advises me that you were at my office during my absence about the first week of May, and that you

desired information in regard to our standard equipment used relative to front ends, ashpans, etc.

I am enclosing you a blue print of our exhaust nozzle, also of our standard smoke box arrangements, also our dump ashpan. All of these blue prints are our standard on the Soo Line and have been for nearly two years. You will note that in our smoke boxes we use the four by four mesh wire. During the year 1911, on lines east of Minneapolis, known as the Wisconsin and Peninsular Divisions, we did not have a single report of fire set by a locomotive and I understand that there were no claims made against this Company on the above mentioned Division, for loss caused by fire set by locomotives during the last year.

We believe we have the danger of fire reduced to a minimum. During the year 1911 we did not find it necessary to issue any new bulletins instructing enginemen in regard to the provisions of fire. However our enginemen are all instructed to report at the nearest telegraph station of any fire noticed on the right of way and if they think the fires should be put out and all dangers lessened they are instructed to stop and do so.

Every locomotive on its arrival at a terminal before it is allowed to leave has the front end door opened and a thorough inspection made of all parts of the front end. The ashpan of each locomotive is also inspected thoroughly each trip.

I will attach a blank from the book in which we keep our daily reports.

During the very dry months we have had in previous years, we have had water cars filled by means of a small five by five pump with one hundred feet of hose attached, left on side tracks near places where there is any liability of fire. These cars have been equipped in this way so that an engine could attach the steam hose to the pump and go to any fire in that immediate vicinity.

On our switch engines at terminals we have installed a syphon attached to the injector pipes with 100 feet of hose which works direct from the injector of the engine and we can fight fire with this engine until the tank of water is used. We find this a very good preventive in terminal yards.

I do not think of any more information I can give you but will be pleased to answer any question you may wish to ask or send you any blue print of our equipment you may desire relative to your business.

Yours truly,
SAM. SHEPARD,
Master Mechanic.

Here combustible slash covers the ground for miles of area, and where figure stands in picture, lies in litter 15 feet in depth.

DUPLICATE.

BULLETIN

Minneapolis, St. Paul & Sault Ste. Marie Railway Co.

MECHANICAL DEPARTMENT.

Gladstone, Mich., July 20, 1910.

No. 331.

Enginemen.

You all understand that it is necessary to prevent engines from throwing sparks which are liable to set fires on account of the very dry conditions that prevail on the Wisconsin and Peninsular Divisions.

Switch engines working around Gladstone Docks and mills must be worked as easily as possible and enginemen should be on the constant watch for sparks.

Way-freight engines switching at spurs should be managed in the same way.

Avoid having ashpan dampers open and do not allow engines to slip when working in such places.

Every engineman should have this important matter on his mind at all times during the exceedingly dry weather.

Yours truly,
SAM. SHEPARD,
Master Mechanic.

Complete report of inspection of entire forest mileage of this road and repeated inspection of front ends and ashpans of all locomotives in its service, filed with Game, Fish and Forestry departments by John A. Higgins, acting as Inspector of Locomotives and Rights of Way.

DUPLICATE.

BULLETIN

Minneapolis, St. Paul & Sault Ste. Marie Railway Co.

MECHANICAL DEPARTMENT.

Gladstone, June, 16th, 1909.

No. 369.

Engineers.

Engines in your charge must not be moved unless screen dampers are locked down and dump ashpan slides are properly closed and dump levers bolted.

It will be considered sufficient cause to take an engineer out of service, when he violates these instructions.

Yours truly,
SAM. SHEPARD,
Master Mechanic.

PERE MARQUETTE RAILROAD COMPANY.

OFFICE OF SUPERINTENDENT.

F. HARTENSTIEN, Superintendent.

Grand Rapids, Mich., March 8, 1912.

Mr. J. A. Higgins, Inspector of Locomotives and Rights of Way:
Dear Sir,—

It has always been the endeavor of the Railroad Co. to take precaution to prevent as far as possible the starting of fires along its right of way and more particularly through the territory in Northern Michigan where the fires would be liable to spread and do damage to the forests. Upon the approach of dry seasons, it has been customary to issue special instructions to all concerned in the Mechanical Department requesting them to give special attention to the conditions of engines, regarding netting, spark arrestors, etc., and also special attention given upon the part of Sectionmen to keep the right of way clear of weeds, brush and other inflammable material that would easily catch fire from sparks or live cinders.

"During the past year, special attention has been given to the condition of the right of way, especially on the Kalkaska Branch which runs largely through timber lands, the brush having been cut and burned as far as possible to do so.

"During the coming year, extra precautions will be taken along these same lines. The Mechanical Department will give special attention to the locomotives to know that the fire boxes, netting, etc., are in as good condition as it is possible to keep them, to prevent fire being dropped from fire box or sparks being thrown from the stack. Special instructions will also be issued at the approach of the dry season to our Section Forces and special effort will be made to see that dry grass, weeds, etc., along the right of way are properly disposed of, and, in fact, every effort made to see that the fires do not get started.

"This applies to territory under my jurisdiction. The Petoskey Division, which largly runs through the fire zone, is under the jurisdiction of the Superintendent at Traverse City, and I feel safe in saying that every precaution will be taken by him also in connection with these matters.

"In addition to the above, our Agents are required to keep on hand at the smaller stations at all times barrels of water, with necessary buckets. At the larger stations, where it is possible and water service can be secured, hydrants and hose are furnished for this protection. Train Masters have standing instructions to inspect the stations from time to time, as they are passing over the road, to see whether or not these matters are being given proper care and attention.

Yours truly,
F. HARTENSTEIN,
Superintendent.

PERE MARQUETTE RAILROAD COMPANY.

BULLETIN ORDER.

Grand Rapids, Mich., June 14, 1911.

There have been bulletins issued from time to time notifying enginemen that when hot cinders are dumped out on the road that the fire must be out of same before proceeding.

I understand that some of our enginemen are not carrying out instructions in regard to putting out the fire after ashes are dumped. Enginemen neglecting to carry out instructions in regard to this will be disciplined.

Yours truly.
S. A. CHAMBERLAIN,
Master Mechanic.

Copy to Mr. W. Boughton.

Grand Rapids, Mich. March 16, 1911.

Enginemen, I find, are not observing instructions in regard to keeping HOPPER FANS closed. Any disregard of instructions relative to this matter will result in discipline.

Yours truly.
S. A. CHAMBERLAIN,
Master Mechanic.

Copy to Mr. W. Boughton.

Grand Rapids, Mich., March 19, 1912.

ROUND HOUSE FOREMEN AND ENGINEERS AND FIREMEN:

Herewith copy of Section No. 12, an act to provide for the preservation of forests of the State of Michigan and for the prevention and suppression of forest and prairie fires:

"It shall be the duty of all railroad companies operating any railroad within this State to use efficient spark arresters on all their engines and to keep their right of way to the width of fifty feet on each side of the center of the main track cleared of all combustible material and safely dispose of the same within said limits of their right of way between the fifteenth day of April and the first day of December. No railroad company shall permit its employes to leave a deposit of fire or live coals, or hot ashes, in the immediate vicinity of woodland, or lands, liable to be overrun by fires, and where engineers, conductors, or trainmen discover that fences or other materials along the right of way or woodland adjacent to the railroad are burning or in danger from fire, they shall report the same promptly at the next telegraph station that they pass. In seasons of drouth railroad companies shall give particular instruction to their employes for the prevention and prompt extinguishment of fires and they shall cause warning placards furnished by the forest commissioner to be posted at their stations in the vicinity of forests and grass lands, and where a fire occurs along the line of their road they shall concentrate such help and adopt such measures as shall be available to effectively extinguish it. Any railroad company wilfully violating the requirements of this act shall be deemed guilty of a misdemeanor and be punished by a fine not exceeding one hundred dollars for each offense, and *railroad employes* wilfully violating the requirements of this section shall be guilty of a misdemeanor and be punished by a fine of not less than five dollars nor more than fifty dollars. But this section shall not be construed to prohibit or prevent any railroad company from piling or keeping upon the right of way, cross ties or other material necessary in the operation or maintenance of such railroad."

Yours truly,
S. A. CHAMBERLIN,
Master Mechanic.

Cy. W. L. Kellogg.

Complete report of inspection of entire forest mileage of this road and repeated inspection of front ends and ashpans of all locomotives in its service, filed with Game, Fish and Forestry department by John A. Higgins, acting as Inspector of Locomotives and Rights of Way.

LAKE SUPERIOR & ISHPEMING RAILWAY CO.
MUNISING, MARQUETTE & SOUTHEASTERN RAILWAY CO.

OFFICE OF GENERAL MANAGER.

W. G. Mather, President.
H. R. Harris, General Manager.
H. A. St. John, Auditor & Gen'l. F'ght. & Pass. Agt.

Marquette, Mich., November 11th, 1912.

Mr. J. H. McGillivray, Deputy State Forestry Warden, Oscoda, Mich.
Dear Sir:—

Replying to yours of the 7th inst., received this morning relative to my opinion as to how best to carry on the state work in forest fire prevention in regard to railways.

I have to say in the first place that I think all railways, especially those in a timber country, are very much alive to the necessity for preventing fires on their rights of way and adjoining property. While they are much interested, I think the state forestry department could promote and retain the interest of the railways and of its employes by the right kind of co-operation, not long distance communications, but by frequent interviews with railway officials, particularly in dry times when there is, of course, much more danger from fire.

I presume that all railroads have different appliances for preventing fires as well as instructions to employes and the state forestry department can do much good by collecting this information and distributing it to other railroads so that the best methods can be selected in this work. This, I understand, the forestry department is about to do, and publish a pamphlet giving that information, but a personal interview seems to me will do much to keep up the interest of the railway officials and employes, and it is my opinion that such interviews, together with the advice of the forestry department who are in touch with all the different railway methods, will be welcomed by railway officials.

In order that you may know what we are doing I have to say that in 1907, realizing the great importance of preventing fires we started a system of reports for the purpose of gathering information from section foremen of all fires which occurred on the right of way as well as off the right of way within their knowledge, whether any valuable property was destroyed or not. I enclose a copy of this blank for your information and you will observe that on the back there are instructions as well as to conductors and engineers which must be observed when any fire has been noticed. From these instructions you will also note that conductors will wire the train dispatcher the location and particulars so that word can be sent to the section men and they are also instructed that section men shall be notified of fires when conditions warrant it

when off their own section so that they can notify the first section crew to go to that fire. Also that on certain branches where only one round trip is made by train each day, trains, will stop and extinguish any fires discovered on the right of way or near the right of way, conductors reporting the occurrence to the train dispatcher from the first telegraph office.

As soon as a report is received of a fire which has evidently been started by an engine, inspection is made of the netting and ashpan as soon as it arrives at the end of its run, and a report made as to the condition of the engine. Regular inspection of engines during the spring, summer and fall months is made every two weeks and special inspections are made when there is reason to belive that an engine has started a fire.

In July, 1909, we commenced equipping our road engines with fire hose. This consists of 50 ft. of 2″ hose equipped with nozzle 5/8″ in diameter and is operated by attaching it to the injector pipe ahead of the injector which attachment can be made in not to exceed five minutes time and then by closing a valve leading to the boiler and operating the injector a stream can be thrown about 90 ft. from the end of the nozzle. We have been able to operate about 500 ft. of hose carried into the woods by this system and the stream thrown from the nozzle seems to be just about the same force as on a 50 ft. hose. A 6,000 gallon engine tank will furnish water for about four hours steady operation of this stream. At the present time we have 18 road engines equipped with hose of this kind and we have had excellent results.

We have a total of 31 engines of which 20 are road engines, and these have been equipped with netting 7/32″ space, No. 10 gauge double crimp for both front ends and ashpans. We have considered this the best size of mesh for this purpose and have investigated a great many spark arresters for locomotives recommended to us but have not found anything which we thought was satisfactory when considering the total results, which take into consideration the throwing of sparks, steaming of engines and cost of application, until we made a test of the spark arrester designed by Mr. F. Slater, Division Master Mechanic of the C. & N. W. Ry., Escanaba.

One engine was equipped with this device last winter and we are so well pleased with it that we have now eleven engines equipped and will equip the balance of our engines as fast as we can do so. It prevents to a large extent the throwing of sparks, does not prevent the steaming of engines and is not too expensive to be attached to any engine. When running after dark only an occasional spark is seen and those are so light that the fire dies out before they strike the ground.

So far as ashpans are concerned we have eight engines equipped with hopper bottom pans with no dampers; six engines are equipped with flat pans with dampers front and back with netting and seventeen have hopper bottom pans with dampers front and back with netting.

All engines with wide fire boxes are protected with netting between the mud rings and the frame.

In case of particularly dry times such as 1910, between Marquette and Lawson we had a light engine running up and down the line during daylight equipped with 500 ft. of hose to put out fires.

Several of our track section gangs are equipped with gasoline motor cars and in case of particularly dry times and on branches where trains only run one round trip a day we frequently instruct the section foreman to follow up these trains, particularly where slashings from cut timber are bad outside of the right of way and in other cases we have taken special precautions to have extra men with gasoline cars follow up trains to watch for fires.

Section foremen have instructions to not burn any ties or rubbish except on instructions from the Chief Engineer, which instructions are only issued when there is no danger of fire getting beyond the control of the men.

On account of more than the ordinary rainfall this year, very few if any special instruction were given until October 7th when the following bulletin was issued:

"BULLETIN NO. 247.

To all Engine and Trainmen and Section Foremen:

October with dead leaves and grass along the right of way may be a bad month for fires if there is not much rainfall.

Therefore, if it is particularly dry, try to observe all instructions preventing fires and use more than ordinary care."

Yours truly,
H. R. HARRIS,
General Manager.

Complete inspection of the forest mileage of this road and repeated inspection of front ends and ashpans of all locomotives in its service, filed with Game, Fish and Forestry department by John A. Higgins, acting as Inspector of Locomotives and Rights of Way.

WISCONSIN & MICHIGAN RAILWAY COMPANY

S. N. Harrison, Receiver

SUPERINTENDENT'S OFFICE

W. H. Wright, Superintendent,

Peshtigo, Wis., May 14th, 1912.

Mr. John A. Higgins, Inspector,
R. R. Locomotives & Rights-of-Way,
Manistee, Mich.

Dear Sir:—

I find we have very little in print concerning protection against forest fires. I am enclosing copies of our Rules A-21 and C-2 applying on the subject.

The manner in which we have handled the forest fire problem in the past is by personal contact with the employes in the different departments. Our road being small and employes not too numerous, we have been able to do this successfully, and with probably better effect than by printed or written instructions. Besides our Road Master is patrolling the line almost daily, by motor car, and comes in close contact with all section men, and keeps in touch with conditions at all times.

The very satisfactory results obtained from this system is reflected in the fact that in something over ten years we have not been called upon to pay a single fire loss to adjoining property.

However, following your suggestions, I have today issued a Bulletin —of which I enclose a copy—and have caused same to be distributed liberally among Agents and Section men, and posted conspicuously on Bulletin Boards and around Shop Buildings.

I also enclose a sample of a letter which I have written to Conductors P. J. Hewitt, Geo. Dashner, N. Couvillon, John Karn, and Engineers J. H. Scholton, J. White, Ed. Kehoe and John Skinner, they being our oldest train and enginemen.

Hereafter any instructions bearing on this matter, which we may find desirable to issue from time to time will be issued in writing and copies kept on file for future reference and record. And in addition to this we will continue our old system of personally keeping in touch with the men and conditions.

If there is anything further you may desire, I will be pleased to furnish it.

Yours truly,
W. H. WRIGHT,
Superintendent.

WISCONSIN & MICHIGAN RAILWAY COMPANY

S. N. Harrison, Receiver

SUPERINTENDENT'S OFFICE

Peshtigo, Wis., May 14th, 1912.

All Employes:—

Another dry season is approaching, and with it the danger of fire incident thereto.

All employes, of whatever department, are expected to co-operate with each other in a combined effort to prevent, and extinguish all fires on or adjacent to the property of this company.

Agents will keep their station buildings clean and free from rubbish and other inflammable materials.

Section men will keep section houses in a like condition. Burn all rubbish, old ties, etc. Cut and burn all brush and burn the grass off the right of way, being careful to not start more fires than can be kept under control. All such fires must positively be entirely extinguished before leaving their locality for the night.

Train and Enginemen will use every precaution to prevent fires. Enginemen must dump ashpans only at Water Tanks, and the fire must be entirely extinguished before leaving it. Should a fire be discovered on, or near the right of way, trains will stop and every possible effort must be made to extinguish it, reporting the same to the first section crew met, or overtaken, and to this office from the first telegraph office.

Shop foremen will see that all buildings and grounds in their charge are kept clean and free from rubbish. Chunks of old waste, waste paper, sawdust, planer shavings, etc., must be picked up and disposed of. All inflammable materials must be kept carefully guarded. The use of torches in the Car Shop, Paint Shop and Oil House is strictly prohibited.

Let every employe make it his business to do everything in his power to prevent fires. Any suggestions offered for improving conditions will be thankfully received and considered.

W. H. WRIGHT,
Superintendent.

WISCONSIN & MICHIGAN RAILWAY COMPANY

S. N. HARRISON, RECEIVER

SUPERINTENDENT'S OFFICE

Peshtigo, Wis., Nov. 14th, 1912.

Mr. J. H. McGillivray, Deputy Forestry Warden, Oscoda, Mich.

Dear Sir:—

Replying to your favor of the 7th inst.

I hardly feel competent to offer any suggestions as to how operations should be conducted from your office for the prevention of forest fires, but I will give you an outline as to how the subject is handled on this line.

We have no set rules for our employes to go by. The matter is handled principally through personal contact with the men. Our Road Master patrols the line by motor car almost daily, during the dry season, and it is his special duty to see that conditions along the right of way are such as to make it as nearly impossible as practicable for the origin and spread of fires.

Front ends and ashpans of locomotives are inspected after every trip and kept in perfect repair.

From time to time bulletin instructions are posted and sent to all agents and section men cautioning them to be continually on their guard, and we never lose an opportunity to commend an employe for his efforts in any certain instance toward preventing or extinguishing a fire, and we make them feel that they are a part of the company and whatever interests the company interests them.

I enclose a copy of bulletin posted May 14th last, also sample copy of a letter sent to train and enginemen. All of the instructions outlined in the bulletin have been lived up to, but owing to frequent rains the past summer extraordinary precautions have not been necessary but ample precautions have been taken at all times as is evidenced by the fact that in the eleven years I have been with this company not a single fire has started from our right of way, and we have not been called upon to pay a claim for fire loss during that period.

We have experienced considerable difficulty, and in fact have found it impossible to induce jobbers and others to properly dispose of choppings and slashings where woods operations have been carried on tributary to our line, especially at landings and yards where posts and poles are peeled, etc., and I believe if the forestry department would extend their efforts in that direction very satisfactory results might be obtained.

I am heartily in accord with the work of your department, and you

will find me ever ready and willing to co-operate with you in endeavoring to stamp out the red plague. Yours truly,

W. H. WRIGHT,
Superintendent.

WISCONSIN & MICHIGAN RAILWAY COMPANY

S. N. HARRISON, RECEIVER

SUPERINTENDENT'S OFFICE

(A 21.) Whenever you see a fire on or near the right of way notify the first section crew you pass, stating the location.

(C 2.) Engineers will not scatter cinders along the track, nor dump them at or near switches. In dumping front-end cinders where there are no pits, have fireman level cinders to flush with the rail, so that the pilots of other engines will not strike them. Front dampers must be closed while running. If necessary to clean ashpan away from cinder pits, fire in cinders must be carefully *extinguished.*

Complete report of inspection of entire forest mileage of this road and repeated inspection of front ends and ashpans of all locomotives in its service, filed with Game, Fish and Forestry department by John, A. Higgins, acting as inspector of Locomotives and Rights of Way.

WILLARD BARNHART, President. J. C. HOLT, Vice Pres. & Treas. N. M. LANGDON, Manager.

H. J. BENNETT, Sec'y.

ANTRIM IRON COMPANY RY.

Mancelona, Mich., Nov. 12, 1912.

Mr. J. H. McGillivray, Deputy Forestry Warden, Oscoda, Mich.
Dear Sir:

Replying to yours of 7th inst. requesting an expression of opinion as to how best to carry on the State work in forest fire prevention in regard to railways.

Out of 227 fires investigated this past season by the Forest Fire Protective Department of the Michigan Hardwood Manufacturers' Association 65% were set by the railroads showing that they are the heaviest aggressors and that the question of protection should be taken up with the railroads very vigorously.

In our logging operations we have found that with our locomotives equipped with screens that are kept tight and which have an opening of 9/64″ to the mesh, size wire 6/64″, and using Michigan White Ash Coal during the dry months, also keeping our locomotives equipped with a long hose and shovels, the fires set by the locomotives are almost nil.

As tending to greatly minimize the setting of fires by the rallroads I would suggest that they be compelled by law to use screens with not over 9/64″ opening to the mesh and a light non-coking coal such as the Michigan or a similar variety.

There should also be a law passed if there is not, permitting fire wardens to stop any railroad locomotive and examine the smoke end to see whether the law is properly complied with.

Perhaps the above suggested restrictions should be limited to the dry seasons of the year.

Yours truly,
N. M. LANGDON,
Manager.

Complete report of inspection of entire forest mileage of this road and repeated inspection of front ends and ashpans of all locomotives in its service, filed with Game, Fish and and Forestry department by John A. Higgins, acting as inspector of Locomotives and Rights of Way.

MANISTIQUE & LAKE SUPERIOR RAILROAD CO.

B. A. Craver, Superintendent.

Manistique, Mich., November 18, 1912.
Refer to file No. 131.

Mr. J. H. McGillivray, Oscoda, Mich.

Dear Sir: Attached please find copies of bulletins issued by this company relating to precautions taken to prevent fires along our right of way.

These copies are sent you by request of Mr. Higgins.

Yours truly,
B. A. CRAVER,
Superintendent.

MANISTIQUE & LAKE SUPERIOR RAILROAD CO.

OFFICE OF THE SUPERINTENDENT.

Manistique, Mich., April 15, 1912.

To all concerned:

The question of forest fires along the railroad is a serious one. We desire to protect not only our own property but the property of others. It is essential that everything should be done to prevent fires, and to put out promptly such as are started, whether on the railroad or near thereto.

Put out any fire you discover along the right of way or near right of way so that the wind will not spread it, and be particular about this in dry weather. Every effort should be made to prevent fires starting and causing damage to timber and other property.

Trainmen, Enginemen, and Sectionmen, must report to the Superintendent any fire they see, and when you get notice of such fire go to it and put it out.

Ordinarily sectionmen should only attend to fires on their own section, but Conductors and Engineers should watch for fires, and if conditions warrant it, to notify first section crew they reach to go to fire on another section and all sectionmen must do so on receiving such a notice.

Bear in mind that if small fires are put out as soon as they are found, it will prevent loss of property of others as well as our own.

Burn no ties or rubbish on right of way unless authorized by Superintendent or Road Master to do so.

Employes must not leave a deposit of fire or live coals, or hot ashes, in the immediate vicinity of wood lands, or lands liable to be overrun by fires. The greatest care must be used by everyone to prevent fires, especially in dry weather.

B. A. CRAVER,
Superintendent.

MANISTIQUE & LAKE SUPERIOR RAILROAD CO.

OFFICE OF THE SUPERINTENDENT.

Manistique, Mich., June 29, 1912.

To all concerned:

Owing to the extreme dry weather the danger of forest fires is greatly increased. It is imperative that every employe should observe the instructions of circular issued April 15th, relative to prevention of forest fires.

A close watch must be kept by all Sectionmen, Trainmen and Engine-

men. Fires must be reported promptly to the Superintendent or Train Despatcher.

Every effort must be made by all parties concerned to put out small fires as soon as they are found to prevent the loss of property of others as well as our own.

The greatest care must be exercised by everyone to prevent fires, especially during dry weather.

B. A. CRAVER,
Superintendent.

Complete report of inspection of entire forest mileage of this road and repeated inspection of front ends and ashpans of all locomotives in its service, filed with Game, Fish and Forestry department by John A. Higgins, acting as Inspector of Locomotives and Rights of Way.

ISAAC STEPHENSON, Pres't, Marinnette, Wis.
H. A. J. UPHAM, Vice-Pres. & Treas, Milwaukee, Wis.
GRANT T. STEPHENSON, Sec'y, Wells, Mich.

ESCANABA & LAKE SUPERIOR RAILROAD CO.

GENERAL OFFICES.

C. W. KATES, Gen'l Sup't, Wells, Mich.

Wells, Mich., May 3, 1912.

Mr. John A. Higgins,
Inspr. Railroad Locomotives and Rights of Way,
Escanaba, Mich.

Dear Sir:—

Referring to your inquiry as to precaution taken by this Company to prevent fires during the dangerous seasons: The character of our business is such as to make it absolutely necessary for us to use every possible precaution for our own protection. All of our employees, including enginemen, trainmen and trackmen are instructed to pay special attention to fires, do everything possible to prevent them, and make every possible effort to extinguish fires when discovered.

Our Mechanical Department is instructed to use extra precaution and to examine locomotives very carefully during the dry season. The front ends of our locomotives are equipped with 12 gauge steel netting, with mesh 3/16 x 1¼ in. We hand you herewith a sample of this netting. The front ends of our engines in service are examined once each week and oftener if necessary and a report of such examination made on form 130, sample of which is herewith enclosed. This examination is made by a competent man and witnessed by at least one other. So you will see

that we have a record at least once each week of the actual condition of the netting in our engines.

Our ashpans are equipped with sprinkler pipes which are connected to branch pipe of injectors, without valves, so that they work automatically and sprinkle the ashpan each time the injector is used. They are also equipped with screen dumpers. Our engineers are instructed to be very careful in dumping pans to see that it is done at a water tank or some other place where there is no danger of fire.

We have a 41 foot, 80,000 lb. capacity flat car equipped with three tanks, each tank 5′ 6 x 7′ 10 x 9′ inside. These tanks are connected at the bottom with 6″ connections. At the end of the tanks, on the end of the car, we have a Duplex steam pump, size 10 x 12 x 8, with 6″ suction and three 2½″ discharge valves for water hose connections. This pump is equipped with necessary connections for connecting it to locomotive quickly. It is also equipped with 33 feet of 6″ suction hose for syphoning water from stream or ditch along the road wherever water may be found. The tanks can also be filled at any of our water tanks.

During the dry season, when there is danger of fires, we keep an engine fired up, in readiness to leave here with this tank on short notice. The tank is also equipped with necessary hose, nozzles, etc. We are enclosing herewith a blue print which shows the dimensions of these tanks and the manner in which they are placed on the flat car.

We are enclosing herewith two blanks which are used for reporting fires. Our track men are all instructed to pay special attention to fires along the road, making immediate report when a fire is discovered, and to stay at the fire and do everything possible to extinguish it.

We do not have very many printed rules and regulations covering these matters, as we believe from our experience that better results are obtained by personal contact with the men, impressing them with the necessity of great care during the dangerous seasons.

If there is any information that you desire in addition to what we have given, we will be very glad to furnish it.

Yours truly,
C. W. KATES,
General Superintendent.

Complete report of inspection of entire forest mileage of this road and repeated inspection of front ends and ashpans of all locomotives in its service, filed with Game, Fish and Forestry department by John A. Higgins, acting Inspector of Locomotives and Rights of Way.

COPPER RANGE RAILROAD COMPANY

OFFICE OF SUPERINTENDENT.

HOUGHTON, MICH.

A. H. EHLER, Superintendent.

October 23, 1912.

Mr. John A. Higgins,
Inspector of R. R. Locomotives & Right of Way,
Manistee, Michigan.

Dear Sir:—

I am enclosing you herewith three copies of bulletins issued so far this year in regard to fires along our right-of-way and I also enclose you two copies of blanks furnished our section foremen to fill out in case of fire along our right-of-way.

I am glad to be able to advise that it has not been necessary for our men to fill out these Blanks for some time.

Our Master Mechanic, Mr. J. A. Berg, advises that our engines are in first class condition and the same will be watched closely to see that they are kept in good shape at all times.

Our Roadmaster, Mr. P. Peterson, instructs his section foremen when he wants them to burn old ties, etc. This is never done in the spring or fall of the year and he is now waiting until the first fall of snow to do this work.

Our summer has been very wet and I cannot see where we should have any trouble anywhere along our line. There has been some fires reported and some reported in the papers as very serious fires in our neighborhood but I can assure you there was nothing to be alarmed over as our section men were on a close lookout. Any fires reported were mostly leaves in the woods and did not get any timber. These fires must have been set by hunters who are now quite numerous in the woods on account of deer and partridge season opened.

If at any time you wish any information in regard to reported fires along our line I will be glad to give it to you. I also would be pleased to accept any suggestions you may have to offer in regard to prevention of fires.

Yours truly,
A. H. EHLERS,
Superintendent.

Complete report of inspection of entire forest mileage of this road and repeated inspection of front ends and ashpans of all locomotives in its service, filed with Game, Fish and Forestry department by John A. Higgins, acting as Inspector of Locomotives and Rights of Way.

COPPER RANGE RAILROAD COMPANY.

OFFICE OF THE GENERAL SUPERINTENDENT.

C. S. Fales, Gen'l Superintendent.
A. H. EHLERS, Ass't Superintendent.

Bulletin No. 144.

Houghton, Mich., June 27, 1912.

All concerned:

The weather is getting warmer and the country along our line is getting very dry and every effort should be made to prevent fires. Engineers must be careful to see that their engines are in the best possible condition to prevent throwing sparks and any defects in this regard should be reported at once. Ashpans should be closed in crossing bridges.

C. S. FALES,
(Formerly) General Supt.

Bulletin No. 72.

Houghton, Mich., April 15, 1912.

All agents, Conductors, Engineers, Section Foremen and all Concerned:

As usual about this time of the year we are liable to have warm dry weather and the liability of setting fire along the line of right of way is very great. Engineers must watch carefully and report from the first telegraph office any signs of fire and great precautions must be taken to keep their engines in condition to throw as few sparks as possible, and comply with the laws which have been recently enacted in regard to the setting of fires in the forests in this state.

C. S. FALES,
(Formerly) Gen'l Supt.

COPPER RANGE RAILROAD COMPANY.

OFFICE OF SUPERINTENDENT.

HOUGHTON, MICH.

A. H. EHLERS, Superintendent.

BULLETIN No. 272.

October 23, 1912.

All Agents, Conductors, Enginemen and all Concerned:

As this is the time of the year that leaves fall from trees and which easily catch fire along right-of-way and in the woods and which may cause fire in timberlands, your attention is again called to the importance of watching carefully and reporting any fires which come to your notice from the first telegraph station.

Also report anything that comes to your notice that will cause fires to be started.

A. H. EHLERS,
Superintendent.

BULLETIN No. 272.

October 23, 1912.

All Agents, Conductors, Enginemen and all Concerned:

As this is the time of the year that leaves fall from trees and which easily catch fire along right-of-way and in the woods and which may cause fire in timeberlands, your attention is again called to the importance of watching carefully and reporting any fires which come to your notice from the firts telegraph station.

Also report anything that comes to your notice that will cause fires to be started.

A. H. EHLERS,
Superintendent.

THE ANN ARBOR RAILROAD COMPANY

AND STEAMSHIP LINES.

Owosso, Mich., March 14th, 1912.

J. H. McGillivray, Deputy State Forestry Warden, Oscoda, Mich.

This company has always endeavored to take every precaution to prevent as far as possible the starting of fires along its right of way and more particularly through the territory in Northern Michigan where the fires would be more liable to spread and do damage to the forests.

Upon the approach of the dry season, it has been the policy of this company to issue instructions to all concerned, and especially to the Mechanical Department, requesting them to give special attention to the condition of engines, regarding netting, spark arrestors, etc., as well as the Maintenance of Way Department to see to it that Sectionmen keep the right of way clear of weeds, brush and other inflammable material that would easily catch fire from sparks and live cinders.

In addition to above, our Agents are required to keep on hand at the smaller stations at all times, barrels of water with necessary buckets.

Any suggestions your department may have to offer from time to time that will in any way assist us in doing away with fires, will be thankfully received.

W. D. DANLEY, Gen. Supt.

THE ANN ARBOR RAILROAD COMPANY

AND STEAMSHIP LINES.

C. P. BURGMAN, Master Mechanic:

Owosso, Mich., Mar. 14th, 1912.

"Our front ends are inspected at the end of every trip and a form (a copy of which is attached) made out and placed on file. The ashpans are inspected at the same time and all necessary repairs made to prevent the dropping of fire.

"Our standard size netting is 2½ x 2½ mesh No. 10 wire.

"Our ashpans on the larger engines are all of the drop bottom type, and on the smaller engines requiring a shallow pan they are arranged so that ashpans can be hoed out from the side, or else equipped with ash pan blowers.

"In addition to the above all ashpans are made double with liners set one inch (1″) from the outside of the pan. This allows air space between liner and side of pan and prevents ash pan from burning through.

"Also all engines are equipped with ashpan sprinklers which are attached to the injectors, and in the dry time the cinders in ashpan are kept continually wet.

Will say that every precaution possible is being taken to keep the spark arresting apparatus in first class condition, especially in dry time.

Complete report of inspection of entire forest mileage of this road and repeated inspection of front ends and ashpans of all locomotives in its service, filed with Game, Fish and Forestry department by John A. Higgins, acting as inspector of Locomotives and Rights of Way.

CUMMER-DIGGINS COMPANY RY.

LUMBER MANUFACTURERS.

Cadillac, Michigan, Nov. 11, 1912.

Mr. J. H. McGillivray, Deputy Forestry Warden, Oscoda, Mich.

Dear Sir:—

Replying to your favor of the 7th in regard to the setting of forest fires by railroads.

In our opinion the principal cause of the railroads setting so many fires is by defective screens. They either use a screen of too large a mesh or the screen is not properly fitted.

Our recommendation would be that the railroads use in their locomotives as small a mesh screen as they can use and fire their boilers without difficulty. We would also recommend that they exercise more care in fitting the screens as we believe that many of the fires are caused by sparks escaping through holes in the screen or at the edges of the screen where it is not properly fitted. We believe that this is one of the chief sources of forest fires and that it can be practically eliminated with proper attention to screening of locomotives.

Very truly yours,
CUMMER-DIGGINS CO.

Complete report of inspection of entire forest mileage of this road and repeated inspection of front ends and ashpans of all locomotives in its service, filed with Game, Fish and Forestry department by John A. Higgins, acting as Inspector of Locomotives and Rights of Way.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY CO.
MINERAL RANGE RAILROAD COMPANY.

OFFICE OF SUPERINTENDENT OF MOTIVE POWER AND MACHINERY

J. J. Conolly, Supt. M. P. & M.

Marquette, Mich., April 12th, 1912.

Mr. J. A. Higgins, Inspector of Locomotives and Rights of Way:

Dear Sir:—In response to your request for a description of our methods of locomotive equipment for the prevention of throwing sparks, and cinders, and setting out fires along the line, I enclose you blue print No. 1997 showing our double netting arrangement for our front ends which is standard on this line in passenger and freight service. We began experimenting with this double netting in July, 1910, and it has proved itself the most efficient and in every way, the most satisfactory spark arrester we have ever tried, as our engines steam as well with the double nettings as without it, during the summer months, which is the only time we use it. In the winter months the outside netting is removed.

All our ashpans are equipped with screen, as well as closed dampers during the summer months. All pans are also equipped with water blowers for cleaning the pans. By this method all fire is killed before leaving the pan.

We have twelve of our local freight engines equipped with pumps, each supplied with fifty feet of 2 inch hose and nozzle, for fighting fire along the right of way, in addition each of these engines carry a suction hose to be used in ditch or stream near where a fire might be located, which would prevent the necessity of running to tank for water. We have also about fifteen engines with hose connection on injector feed pipe together with fifty feet hose to be used for the same purpose. With any of this equipment we are able to throw a stream of water in the neighborhood of a hundred feet. This equipment has proved its efficiency on several occasions where there might have been serious fires.

Will also state that all our locomotives have a front end and ashpan inspection on their arrival at terminals, and any defects found are repaired before the engine is allowed to go back into service, a record of all such inspections is kept in book for that purpose, so that at any time it can be referred to. (I enclose sample of leaf taken from book.)

Am also enclosing samples of perforated steel netting that we use in our front ends of locomotives, together with copies of instructions issued

to foremen and others in relation to the proper inspection and care of locomotives from time to time.

Hoping that the information given is what you are seeking, I am

Very truly yours,
J. J. CONOLLY,
Supt. Motive Power.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY, MINERAL RANGE RAILROAD.

OFFICE OF THE GENERAL SUPERINTENDENT.

Marquette, Mich., Nov. 11, 1912.

Mr. J. H. McGillivray, Deputy Forest Warden, Oscoda, Mich.

Dear Sir:—As to how best carry on the state work in forest fire prevention in regard to railways. Inasmuch as your question applies only to railways, I would say that in my opinion the best way to carry on the work is by constant vigilance and inspection. If you were to ask me as to what proportion of fires were set by locomotives, I would say a small proportion. I think it has already been estimated that about twenty per cent of the fires set along the railways are set by locomotives. However, a greater number of the fires are set by campers, hunters and farmers clearing land.

We have had very little trouble from forest fires this season, that can be attributed probably to the fact that it has been an unusually wet summer on account of frequent rains, and this, of course, has had a tendency to keep forest fires in check. In the month of October we had two fires along the railway reported, which were duly investigated, with a view of determining their origin. One of them was found to have been set by a farmer clearing his land, and the other, the cause is unknown.

We have given your department from time to time a report of what work we do in the matter of clearing our right of way, and putting double nettings in locomotives, and fire pumps on locomotives, for the prevention of fires, and I think you will bear me out, when I say that we have taken every precaution in this respect to prevent the starting of fires along the right of way.

Yours truly,
C. E. LYTLE,
Genl. Supt.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY CO.
MINERAL RANGE RAILROAD COMPANY.

OFFICE OF SUPERINTENDENT OF MOTIVE POWER.

Marquette, Mich., May 25th, 1912.

NOTICE.

Round House Foremen and Others:—

We have equipped all local freight engines with fire pumps, hose, etc., to be in readiness to fight fire along the right of way, and you will see that all enginemen whom you assign to those engines make themselves thoroughly familiar with this apparatus. We have an extra suction hose clamped to side of tank, this is to be used in case you have put a small quantity of water in tank, and there might be a ditch or stream near where the fire is located, then you can couple the extra suction hose to pump feed pipe, and throw water from the ditch or stream on the fire. or it can be used to fill your engine tank with if you should get shy of water, and find a suitable stream or ditch to take water from.

Foremen are expected to couple up the hose, and use it at terminals once or twice a week, so that you may know that it is in working order, and that crews are familiar with its use.

J. J. CONOLLY,
Supt. Motive Power.

Marquette, Mich., April 2nd, 1912.

NOTICE.

Round House Foremen:—

Now that everything is getting dry along the road, you will replace the netting dampers that you removed last fall from engines.

J. J. CONOLLY,
Supt. Motive Power.

Marquette, Mich., July 2nd, 1912.

NOTICE.

Round House Foremen:—

While inspecting nettings you will remove netting door once a month, so you can inspect the baffle plate.

While looking over Eng. 203 today to try to locate where the amount of fire the engine was said to be throwing came from, we found some

large holes worn in baffle plate in front of the tubes. The only way this could be discovered was by removing the door in the netting.

This you will do hereafter when washing out boilers.

J. J. CONOLLY,
Supt. Motive Power.

Marquette, Mich., Aug, 10th, 1912.

NOTICE.

Extracts from state laws relative to spark arresters on railway locomotives:—

All locomotives operated on any railroad other than a logging railroad shall be equipped with the most practicable spark arresters so constructed to give the greatest possible protection against the escape of sparks and cinders from the smoke stacks thereof, and each locomotive will be provided with the most practicable device to prevent the escape of the live coals from ash pans and fire boxes, and said devices between March 1st, and December 1st shall at all times be maintained in good repair.

It shall be the duty of the superintendent of motive power or equivalent officer of each such railroad to designate an employe of such railroad at each division point, and round house who shall examine each locomotive each time it leaves the division point or round house between March 1st, and December 1st, and such employe shall be held responsible for the proper carrying out of the provisions of this section, but without relieving the company from the responsibility hereunder.

Round House Foremen:—

The above is an extract from the state laws of Michigan and Wisconsin, and must be lived up strictly to the letter. See that you do it.

J. J. CONOLLY,
Supt. Motive Power.

Marquette, Mich., June 24th, 1912.

Round House Foremen:—

Now that the weather is hot and everything drying up, I want you to give particular attention to front ends, and ashpan inspection on all locomotives.

There has been several reports of engines setting out fires lately, and the only way this can be done is to have your netting out of order.

See that the slightest defect is repaired before you let an engine go out.

Some of you are negligent about sending in your inspection books the first of each month, I want this done and be particular about your

records of these inspections as I am liable to call on you any day for copies, or information relative to this matter, and it is very important that I get it when I do.

J. J. CONOLLY,
Supt. Motive Power.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY CO.
MINERAL RANGE RAILROAD COMPANY.

OFFICE OF GENERAL SUPERINTENDENT.

Marquette, Mich., June 1st, 1912.

CIRCULAR NO. 115.

To Conductors and Engineers:

The question of forest fires along the railroad is a serious one. We desire to protect not only our own property, but the property of others. It is essential that everything shall be done to prevent fires, and to put out promptly such as are started, whether on the railroad or near thereto.

We have equipped certain engines with pumps for this purpose, and conductors and engineers running engines equipped with these pumps are required to put out every fire on the right of way or near thereto which they can reach with their hose.

It is made the duty of conductors and engineers whose engines are not equipped with pumps to notify the General Superintendent and Division Superintendent at the first telegraph station of any fire on or near the right of way which they have not been able to put out.

They shall also notify the engineer and conductor of any engine equipped with such pump, which they meet or pass, and any engineer and conductor receiving such notice will report to the train despatcher for orders to enable them to go and put out the fire. They shall also notify section crews which they may pass.

Ordinarily section men should only attend to fires on their own section, but if another section gang is the first one reached after discovering the fire, and the conditions, in the mind of the conductor, warrant it, notify the adjoining section gang to go to the fire.

All conductors and engineers will notify the General Superintendent and Division Superintendent by wire of all fires near the railroad track which cannot be put out with our equipment, giving as full particulars as possible.

They will also notify the General Superintendent by wire of all large fires they see even though not very near the right of way.

The purpose of this report is to enable the Company to make prompt investigations.

The Company has been to considerable expense in purchasing the pumps and equipping them for this service exclusively, and we expect you to do everything you can to save property from fire, not only that belonging to the Company, but any property you can reach threatened with fire.

C. E. LYTLE,
General Superintendent.

DULUTH, SOUTH SHORE & ATLANTIC RAILWAY CO.
MINERAL RANGE RAILROAD COMPANY.

Copy. Marquette, Mich., April 4, 1912.

CIRCULAR NO. 105.

All Section Foremen Mackinaw Division:

Just as soon as the snow is off the right of way and the grass gets dry, I want you to let the gauging and other work go long enough for you to burn the grass and rubbish the full width of the right of way and from one end of the section to the other. Of course, there are some sections that will not be able to do any burning for some time, but there are some sections that can burn it in places now, and burn it just as soon as you possibly can as we must burn it before the snow is all gone from outside of the right of way. Also burn all piles of logs and rubbish you piled up last fall.

Burn the north side of the track when the wind is from the north and on the south side when the wind is from the south. Watch all the fires you set and don't set any more fires at one time than you can keep under control and keep it from going outside of the right of way and see that all fires are out before you leave it. Get at this burning just as soon as you possibly can.

Yours truly,
A. NELSON,
Roadmaster.

Copy. Marquette, Mich., April 8, 1912.

CIRCULAR NO. 36.

All Section Foremen—Houghton Division:

Please arrange to clean up all the cinders and rubbish along the track and around station grounds; also clean up around all section houses in good shape and keep them clean both inside and out.

Also, arrange to burn all the grass along side the right of way before the snow goes out of the woods when there will be danger of the fire spreading. And as you take out your shims arrange to pile them up in neat double piles and drive stakes at each end of the piles and pile them back 10 or 12 ft. from the rail. Have the stakes high enough so that you will be able to find the piles again next winter when the snow gets deep.

I think with the amount of shims you have received this winter you will not require many shims next winter only a few of the smaller ones. Also arrange to put water barrels on all section houses and other company buildings and also on all your bridges and see that the barrels are filled with water and kept filled at all times until you receive notice to remove them in the fall. Please arrange to have all these barrels in place not later than April 15th.

Watch your track close night and day now while the water is high and there is danger of washouts. Please acknowledge receipt of this circular.

Yours truly,
J. E. RABY,
Roadmaster.

Complete report of inspection of entire forest mileage of this road and repeated inspection of front ends and ashpans of all locomotives in its service, filed with Game, Fish and Forestry department by John A. Higgins, acting as Inspector of Locomotives and Rights of Way.

MANISTEE & NORTH-EASTERN RAILROAD COMPANY.

OFFICE OF GENERAL SUPERINTENDENT.

Manistee, Mich., November 10th, 1912.

Mr. J. H. McGillivray, Deputy Forest Warden, Oscoda, Mich.

Dear Sir:

We have your letter of November 7th, asking for expression of opinion as to how best to carry on the state work in forestry fire prevention, as regards railroads.

Under date of May 20th, we furnished Mr. John A. Higgins with drawing of our locomotive front ends and nettings, together with explanation of same by Mr. Nuttal, our Superintendent of Motive Power. We also sent him copies of bulletins issued to train and engine men and track men, giving instructions as to procedure in case of fires along our line.

Our company on account of its running through various tracts of timber and through considerable valuable farming territory, are intensely interested in the prevention of fires and we are doing everything that is possible, to reduce such fires to a minimum. We depend to a great extent for our revenue on the hauling of farm products and timber, and from a selfish reason, if no other, would naturally be watching for every opportunity to prevent these fires.

I feel quite sure that the railroads of this state are being obliged to pay claims, and are receiving credit for a great many fires that are set by farmers themselves, and by tramps in the woods. We have noticed that where cars are set off on obscure sidings, especially near lakes, that the saturated waste from the boxes have been stolen for the purpose of building camp fires, and very often at such a place large forest fires have their start.

So far as the railroads are concerned, I believe that your department is going at the matter in the right way, viz.: The thorough inspection of the locomotive front ends and netting, and by impressing upon the railroads the importance of keeping these up to the highest standard, and by having an inspector, such as you have in our territory, who is on the ground frequently enough to see that it is done.

I am sure you will concede that you have met with hearty co-operation with the railroad men and found that they were as anxious to have forest fires done away with, as was your department.

Yours truly,
E. H. O'NEIL,
General Superintendent.

Complete report of inspection of entire forest mileage of this road and repeated inspection of front ends and ashpans of all locomotives in its service, filed with Game, Fish and Forestry Department by John A. Higgins, acting as Inspector of Locomotives and Rights of Way.

Here forest fires have burned all humus from the soil, reducing with furnace heat, sandy streaks to balls and slugs of glass.

MANISTEE & NORTH-EASTERN RAILROAD COMPANY.

OFFICE OF GENERAL SUPERINTENDENT.

E. H. O'Neil, Gen'l Superintendent.

Manistee, Mich., May 20, 1912.

Mr. Jno. A. Higgins,
Inspr. of R. R. Locomotives & Right of Way,
Manistee, Mich.

Dear Sir:—

Regarding the prevention of right of way fires along our line. I am enclosing, herewith, blue prints 799, 475 and 798, showing style of Locomotive Front End and Nettings used by this Company, together with explanation of same by Mr. Nuttall, Supt. Motive Power.

From the drawings you will get a good idea of the operation of this style front end and taking into consideration the fineness of the mesh of our netting and the fact that we have a daily examination of all our locomotive front ends makes it reasonably certain that no fires can be set from our locomotives. We have been experimenting for some years on a front end that would guarantee proper steaming of locomotive and at the same time avoid setting fires and we believe that we have finally solved the problem; at least there has been no evidence that any fires have been set by our locomotives since the adoption of this front end arrangement.

I also enclose two circulars issued by S. J. Scott, Superintendent, to Track Men and Train and Engine Men regarding the handling of fires along line and instructions for the prevention of them.

If there is any further information that we can give you, do not hesitate to call upon us.

Yours truly,
E. H. O'NEIL,
Gen'l Supt.

MANISTEE & NORTH-EASTERN RAILROAD COMPANY.

OFFICE OF SUPERINTENDENT OF ROLLING STOCK AND MOTIVE POWER.

W. H. NUTTALL, Supt.

Manistee, Mich., May 14, 1912.

E. H. O'Neil, Gen't Supt.,
City.

Dear Sir:—

Blue Print No. 799 represents a side and end view of our ashpan cleaner. It consists of a one and one-half inch pipe tapped into back boiler head of the locomotive. This pipe connects with a header in the back end and bottom of the ashpan. Projecting from the header are six nozzles with oblong openings. The openings are 3/16 of an inch wide by 1½ inches long, placed in a horizontal position. An operating valve is located at a point near where pipe is connected to boiler head.

Principle of operation. As the temperature of the water in boiler is due to the pressure of steam carried, the discharge at the nozzle is saturated steam, which extinguishes all fire in the ashpan and ejects same at the front end of pan.

Yours truly,
W. H. NUTTALL,
Supt. Motive Power.

Manistee, Mich., April 1st, 1912

CIRCULAR NO. 145.

All Section Foremen:—

You will burn all old ties and brush along the right of way, also all dead grass before it gets too dry. You will burn all dead grass by stringing fire in it, but do not let it spread further than what you can properly control and never let it get outside of the right of way.

Great care must be taken during the dry season to see that no fires are set or allowed to burn along the right of way or outside of right of way and in case fire starts and you cannot control it, you will report it to this office at once. You will also report all fires along your section each day and whether they are on right of way or not.

S. J. SCOTT,
Supt.

Manistee, Mich., April 1, 1912.

Train and Engine Men:—

Your attention is again called to the importance of keeping close watch for fires along the line. Also to use all precaution possible to prevent fires. In case you notice any fires along the line on the right of way or outside of the right of way, you will stop and notify the first section crew, also report from the first telegraph station to this office of any fires you find, giving location.

Engineers will be very careful in cleaning fires and ashpans along the line and be sure that all clinkers or cinders taken from fire boxes or ashpans are all wet down and that no fires will ignite from them.

S. J. SCOTT,
Supt.

SUPERINTENDENT'S OFFICE, NORTHERN DIVISION

GRAND RAPIDS AND INDIANA RAILWAY COMPANY.

Grand Rapids, Mich., March 7th, 1912.

Mr. John A. Higgins, Inspector Locomotives and Rights of Way.
Manistee. Mich.

Dear Sir:

As per our conversation this afternoon, in connection with instructions and action taken by the G. R. & I. Railway Company with reference to prevention of fires.

I am enclosing herewith copy of our General Notice of September 22nd, 1909, to Enginemen and Firemen.

Every spring we re-plow fire guards along the edge of right of way through the territory of the fire zone, of approximately 150 miles.

Station buildings and other company buildings are provided with fire barrels and fire buckets, which are kept filled at all times. In addition, in the larger cities and in small towns where they have water works, we provide fire hydrants and fire hose, which are only to be used in case of fires.

All agents have positive instructions that fire pails and barrels must be kept filled, and that no obstructions are to be placed in the way of, or in the path, of the fire hydrants.

In addition to this, we have blank form, copy of which I enclose, of report of inspection of buildings and grounds, which are filled out by the Track Supervisors and Master Carpenter, and sent in, and if everything is not in excellent shape, the agent's attention is called to same immediately.

In 1905 we posted notices issued by the State Game, Fish and For-

estry Warden, being Section 12 of an Act for the Preservation of Forests, and for the suppression of forest and prairie fires, at all stations in the fire zone. These have been replaced from time to time.

Finally, I would state that all our employes realize the importance of prevention of fires, and work to that end.

Yours truly,
J. W. HUNTER,
Superintendent.

P. S. In extreme dry weather we have section men patrol tracks on motor cars after all trains.

GRAND RAPIDS & INDIANA RAILWAY COMPANY.

OFFICE OF SUPERINTENDENT OF MOTIVE POWER.

JAMES E. KEEGAN.

Grand Rapids, Mich., Mar. 7, 1912.

In your reply refer to F-80.

Mr. J. A. Higgins, Inspector Locomotives and Rights of Way:

Dear Sir:

Referring to your visit to this office and our conversation on the subject of prevention of fires that may be caused by improper condition of apparatus on locomotives:

I enclose herewith, for your information, blue print from our tracing No. 2094, showing locomotive front end arrangement in general use on this line and which is considered standard arrangement on the Pennsylvania Railroad System, and designed with a view of preventing the emission of fire from locomotive stacks, the arrangement at the same time providing for suitable regulation of the draft on fire.

You will note that the netting is made of steel wire, with two and one-half openings to each square inch of netting, the openings being approximately 3/16″ square. Our claim is that with the netting in good condition—that is, no broken wires or no openings at points where netting is attached to sides of arch—sufficient fire cannot escape through stack to cause fires, the particles that are permitted to escape through openings in netting being too small to permit of holding fire.

I also enclose blue print from our tracing No. 2241, showing the general arrangement of ashpans in use on the locomotives on this line. Wherever openings occur in the ashpan necessary to secure the proper amount of air for combustion, these openings are protected by wire nettings, with a view of preventing any fire whatever escaping from pan. At times, however, through the carelessness of men employed at cinder pits and engine houses, holes will be made in this netting and not re-

ported to our shop people, and occasionally engines are allowed to remain in service in condition that allows them to drop fire from pans.

It is our object, however, to maintain our ashpans and front end arrangements in the best possible condition, to prevent fires being set by locomotives.

Yours truly,
JAMES E. KEEGAN,
Supt. Motive Power.

GRAND RAPIDS & INDIANA RAILWAY COMPANY—NORTHERN DIVISION.

SUPERINTENDENT'S OFFICE.

September 22nd, 1912.

GENERAL NOTICE 254.

Enginemen and Trainmen:

For the protection of company and individual property from fire damage originating from sparks from locomotives, enginemen will report by wire, from first telegraph office, when sparks or live cinders of unusual size are escaping from stack, and when advisable train tonnage will be reduced to permit movement of engine without sparks escaping from stack, to terminal where proper repairs can be made.

Enginemen will see that hoppers on dump ashpans are in good order and closed tightly before leaving terminal, and if defective report condition to Roundhouse Foreman before leaving terminal, and will see that they are closed properly when dumping pan at any point.

The arrangement of water line to ashpan with which a number of our engines are equipped should be used frequently to wet the contents of pans and to prevent fire escaping.

Enginemen operating engines with shallow pans (old style) provided with dampers at each end, should when possible operate but one damper as the use of both will at times permit fire to escape from pans.

Enginemen will make special reference to condition of ashpan, stack and netting (as relates to fire escaping) at the end of each trip on regular work slips.

J. W. HUNTER,
Superintendent.

GRAND RAPIDS & INDIANA RAILWAY COMPANY.

Grand Rapids, Mich., March 10, 1912.

Master Mechanics and Foremen of Engine Houses will see that ashpans, smoke box front, exterior of smoke box, cinder chute and stack are properly inspected after each trip.

The door on smoke box front must be opened when boilers are washed and the netting and deflector plates must be properly inspected. A light should be used back of deflector plates in order to detect any defects.

The condition of ashpans, smoke box and front, cinder chute, stack, netting and deflector plates, and statement of repairs made must be carefully noted in this book, and signed in ink by the foreman and inspector making the examination.

The defects (if any are found) should be described accurately on line opposite the description of parts and the repairs made should be written on line under head of "Repairs Made."

When, from unavoidable cause, an engine cannot be examined the reason for not examining it should be written on blank.

When book is filled send it to the office of the superintendent motive power.

J. E. KEEGAN,
Superintendent Motive Power.

Complete report of inspection of entire forest mileage of this road and repeated inspection of front ends and ashpans of all locomotives in its service, filed with Game, Fish and Forestry Department by John A. Higgins, acting as Inspector of Locomotives and Rights of Way.

GRAND RAPIDS & INDIANA RAILWAY COMPANY.

NOTE.

Master mechanics and foremen of engine houses will see that ashpans, smoke front, exterior of smoke box, cinder chute and stack are properly inspected after each trip.

The door on smoke box front must be opened when boilers are washed, and the netting and deflector plates must be properly inspected. A light should be used back of the plates in order to detect any defects.

The condition of ashpans, smoke box and front, cinder chute, stack, netting and deflector plates and statement of repairs made must be carefully noted in this book and signed in ink by the foreman and inspector making the examination.

The defects, if any are found, should be accurately described on line

opposite the description of parts, and the repairs made should be written on line under head of repairs made.

When from unavoidable causes, an engine cannot be examined, the reason for not examining it should be written on blank.

When book is filled send it to the office of the superintendent motive power.

J. F. HAYES,
Asst. Master Mechanic.

CHICAGO & NORTH WESTERN RAILWAY CO.

Escanaba, Mich., May 3, 1912.

Mr. J. A. Higgins,
State Inspector of Loco. & Right of Way,
Manistee, Mich.

Dear Sir:

In compliance with your request while in my office this a. m. I am giving you copies of some of the bulletins that have been put up for the benefit of shopmen and enginemen for the prevention of fires, and in this connection I would like to state that it is my honest opinion that the Chicago and North Western Railway is using the very best precaution against the setting of fires that is known to anyone in the railroad business.

The Chicago and North Western Railway is equipping their engines with what is called a box netting and up to April 16 of the present year they had 1,037 locomotives equipped with this box netting.

The principle of this netting is such that it can be made absolutely tight, having no openings whatever in it except the openings in the mesh of the netting. It is impossible to get shop men to be careful enough to fit netting diaphram plates and other paraphernalia in the front end as close as can be done by the principle of this box netting. Another advantage in the box netting is that when in place the entire box can be seen at a glance and any defect in it is observed at once. This is also impossible with the customary style of front end in use.

We are also very careful with our ashpans and practically all of the engines have water pipe leading into the ashpan so that if live fire should drop into the ashpan it can be extinguished to prevent warping of the pans, and during the dry season of the year we require our netting inspectors to examine the netting each trip and make record of it. There is a book provided for this purpose.

Section men are furnished with post cards on which they report every case where fires have been started on or near the right of way, giving as near as possible the engine that passed by there just before the fire. This engine is immediately examined when she reaches the destination in the direction in which she is going in, and not permitted

to go out again until a thorough examination has been made of her to locate any defect wihch might exist.

Yours truly,
F. SLATER,
Master Mechanic.

P. S. I would also like to mention that switch engines working around saw mills and lumber yards are provided with a netting hood secured to the top of the stack as an extra precaution against throwing cinders. We also use this hood on our logging branches.

CHICAGO & NORTH WESTERN RAILWAY CO.

SUPERINTENDENT'S OFFICE.

Copy.

Escanaba, Mich., June 30th, 1912.

All concerned:

We are sending herewith to each agent in Michigan, two fire warning notices, which must be posted in each station.

Below is a copy of Section 12, of the laws of Michigan, which defines the duties of Railroad Companies and their employes:

(Section 12 quoted in original Bulletin.)

The prevention and suppression of forest fires is a very important matter, and all employes must do everything in their power to accomplish this and also to carry out the provisions of the law.

When engineers, conductors or trainmen, see a fire burning on the right of way, or near the same, they should notify sectionmen when possible, or leave word at first station so that notice can be gotten to the sectionmen. They should also notify this office of any large fires they see, even though not near the right of way.

It is the usual practice for section crews to attend to fires only on their own section, but where occasion arises that sectionmen discover a fire on another section, and men are not there to look after it, they will go and put it out.

The hearty co-operation of all employes is requested in doing everything possible towards the prevention and suppression of forest fires.

Yours truly,
W. B. LINSLEY,
Superintendent.

Escanaba, Mich., April 20, 1912.

All Roundhouse Foremen:

Gentlemen:

A great many fires are being set which are being charged to locomotives. You must give the inspection of netting the very closest possible attention. Do not permit any netting to remain in engines that is in any way defective. This is of the greatest importance and must not be made light of.

Yours truly,
(Signed) F. SLATER,
Master Mechanic.

Escanaba, Mich., May 12, 1912.

All Roundhouse Foremen:

Gentlemen:

You positively must arrange to inspect netting and ashpans of all engines in your charge daily and make a record of its condition. Allow nothing to go out that is defective.

Acknowledge receipt.

Yours truly,
(Signed) F. SLATER,
Master Mechanic.

Escanaba, Mich., March 25, 1912.

All Roundhouse Foremen:

Gentlemen:

This is the time of the year when we always have our greatest trouble by the locomotives setting fires. This is due to the old grass being cured, or it might be called hay. This burns very readily and we will continue to have fires until the grass gets green. Therefore, we will be obliged to make a daily inspection of all netting and ashpans.

Please get right after this so that we will have as few reports as possible.

Yours truly,
(Signed) F. SLATER,
Master Mechanic.

Escanaba, Mich., April 3, 1912.

All Roundhouse Foremen:

Gentlemen:

It is claimed that many of our engines are throwing fire. We certainly cannot stand for this. They must be given the very closest possible examination, and I want to call your special attention to the connection between the box and the stack.

Yours truly,
(Signed) F. SLATER,
Master Mechanic.

CHICAGO & NORTH WESTERN RAILWAY CO.

SUPERINTENDENT'S OFFICE.

Copy.

Escanaba, Mich., May 26th, 1912.

Burning of Ties:

Dear Sir:—Notwithstanding the notices which have been given relative to burning of old ties, and attention called to state laws, etc., I find Section Foremen are paying little attention to it. Hereafter you will not allow the old ties burned without getting orders so I may know who to hold responsible for it. This morning I found some ties burning and the fire running outside the right of way, sectionmen paying no attention to it whatever.

Yours truly,

W. B. LINSLEY,

Supt.

Mr. M. McFadden,
Mr. H. Oderdorffer,
Mr. M. Keull,
Roadmasters.
Mr. Wm. Manley,
Mr. D. Mooney,
General Foremen.

CHICAGO & NORTH WESTERN RAILWAY CO.

Escanaba, Mich., May 11, 1912.

All Roundhouse Foremen:

Gentlemen:

I must again call your attention to the large amount of fire that is being dropped on the track from ashpans and something must immediately be done to keep ashpans in shape to prevent the fire from dropping from them.

This is a very serious matter. We are having a great many complaints from section men for fires dropping from the ashpans, and we will soon have warm weather and dry conditions, and unless a remedy is applied at once, we will have some serious fires started.

All roundhouse foremen must give this personal attention and stop all holes in ashpans where live fire can drop thru.

Yours truly,

F. SLATER,

Master Mechanic.

CHICAGO & NORTH WESTERN RAILWAY CO.

Escanaba, Mich., May 11, 1912.

All Engineers:

Gentlemen:

We are having a large number of complaints from engines dropping fire from the ashpans and I must request that all engineers watch this matter closely and if fire is seen dropping from the ashpan, they must make a report of it on arrival at destination so that the ashpan can receive attention before the engine is permitted to go out.

Engineers will also see that the fireman uses the water for wetting the live fires which drop into the ashpan, so as to prevent the pans from warping and becoming defective.

This is the object of having water in pan, and a little care on the part of the engine crew will save this Company an endless amount of expense, not only to repairs to ashpans which have been allowed to warp, but in settling fire claims.

Yours truly,
F. SLATER,
Master Mechanic.

CHICAGO & NORTH WESTERN RAILWAY CO.

Escanaba, Mich., May 6, 1912.

Mr. W. Peterson, Foreman,
Escanaba.
Mr. F. O. Fernstrom, Foreman,
Escanaba.

Gentlemen:

The same rule that was in effect last summer, that engines working on logging branches must be protected with a hood on the stack, must be put into effect this summer. I wish you would commence at once to see that this is done and do not fail in it.

Yours truly,
(Signed) F. SLATER,
Master Mechanic.

Escanaba, Mich., August 17, 1912.

All Roundhouse Foremen:

Gentlemen:

I am sending you herewith copy of Mr. Quayle's letter No. 1617. I am sure that there has been enough said on the subject of inspection of netting. While this letter does not use the term "netting," it refers to all parts of the front end which resists the escaping sparks. The connection between the box and stack is as important as the netting itself and I cannot impress upon you too strongly the importance of a thorough inspection of all parts of the front end to prevent the escaping of any live fire.

If the present box netting is properly installed and kept in proper repair, it is as near a perfect spark arrester as has yet been introduced into a locomotive, but, of course, will not resist the escapement of sparks if there are holes in it larger than the opening in the mesh.

The netting inspector will personally be responsible for any of these defects. If the netting is inspected as frequently as per instructions on this subject, an engine cannot get defective without being noticed before she becomes dangerous.

Yours truly,
F. SLATER,
Master Mechanic.

Complete report of inspection of entire forest mileage of this road and repeated inspection of front ends and ashpans of all locomotives in its service, filed with Game, Fish and Forestry department by John A Higgins, acting as inspector of locomotives and rights of way.

RECORD OF FOREST FIRES 1911-1912. CLASSIFICATION NO. 3. BY MONTHS OF OCCURRENCE.

Months.	No.	Acres.	Kind of land.	Timber.	Other property.	Damage.	Cost.
April, 1911	13	2,719 160	..... State slashings.	Hemlock, hardwood, jackpine.	Cedar posts, etc., cordwood, farm property, buildings.	$18,060 00	$71 50
April, 1912	.....	.....	.....	.....	.....	.....	.....
May, 1911	37	16,097 4,080	Meadow State cedar slashings.	Cedar, hardwood	Logs, lumber, buildings, cordwood, cedar products.	53,375 68	1,093 45
May, 1912	54	19,252 40	Brush slashings State.	Norway and jackpine	Cordwood, decked hemlock, logs, buildings.	50,028 00	892 00
June, 1911	2	2,000	Slashings	Spruce, cedar	.....	6,985 00	476 05
June, 1912	35	10,247	Slashings	Saplings, 2nd growth poplar	Cedar posts, poles, ties, farm crops, etc.	3,135 60	884 60
July, 1911	112	124,485 360	Slashings State stumps.	Small timber	Maple ties, etc., resort property, cordwood, villages, cars, cattle.	3,370,828 50	8,166 25
July, 1912	38	7,545	Hardwood slashings	Norway and white pine	Logs, camp property, barns, etc	*13,886 00	675 10
August, 1911	11	2,312 15	Slashings State brush.	.....	House, logs, fence	450 00	139 00
August, 1912	1	160	Slashings	.....	.....	.....	.....
October, 1911	16	4,794	Swamp slashings	Cedar, spruce, pine	Logs, hay, fence, cordwood, etc	20,559 00	486 00
October, 1912	11	2,885	Plains, slashings	Second growth poplar	.....	600 00	105 00
Total, 1911	191	152,407 4,615	..... State.	.....	.....	$3,470,258 18	$10,432 25
Total, 1912	139	40,089 40	..... State.	.....	.....	$67,649 60	$2,556 70

*$1,500.00 benefit.

RECORD OF FOREST FIRES 1911–1912

Counties.	Year.	No. of Fires.	Acres burned.	Kind of land burned over.	Timber.
Alcona	1911	8	4,479	Plains, swamp, meadow	
Alcona	1912	9	3,560	Brush, plains, swamps, meadow.	Cedar
Alger	1911	4	5,541	Swamp, slashing	Cedar and hardwood
Alger	1912	8	1,479	Slashings, plains	Second growth poplar
Alpena	1911	8	1,765	Hardwood and cedar slashings, meadow.	Pine and hardwood
Alpena	1912				
Antrim	1911	8	8,083	Slashing, swamp, resort property.	Cedar, hemlock, hardwood.
Antrim	1912	2	3,950	Slashings, small timber	
Baraga	1911	2	1,200	Slashings	Hardwood, hemlock
Baraga	1912				
Benzie	1911	2	84	Hardwood, slashings	Hardwood
Benzie	1912				
Charlevoix	1911	6	10,655	Meadow, swamp slashings	Chemical and hardwood
Charlevoix	1912	6	340	Slashings	Hardwood
Cheboygan	1911	15	22,862	Stump, plains, swamp	Hemlock, hardwood, pine, cedar, birch.
Cheboygan	1912	16	823 40	Slashing, swamp State.	
Chippewa	1911	3	615	Slashing	
Chippewa	1912	9	2,485	Meadow, slashing, pine, swamp, good soil.	
Crawford	1911	6	10,440 400	Meadow, swamp, slashing	Pine, oak, second growth pine.
Crawford	1912	4	5,870	Pine, slashings, plains	
Delta	1911	4	370	Swamps, slashings	
Delta	1912	1	1–4	Swamp	
Dickinson	1911	7	1,301	Swamp slashings	Cedar, pine, hardwood
Dickinson	1912	1			Hardwood
Emmet	1911	7	4,183	Swamp slashings	Cedar, hemlock, hardwood
Emmet	1912	16	1,515	Slashings, plains	Young poplar
Gogebic	1911	7	415	Slashing, pine, swamp	Pine, cedar, hardwood
Gogebic	1912	4	865	Hardwood, pine slashings	Second growth hardwood.
Grand Traverse	1911	3	215	Slashing, farm land, swamp	Hardwood
Grand Traverse	1912	5	125	Meadow, hardwood, orchard	
Houghton	1911	4	3,800	Hardwood choppings	Maple
Houghton	1912	2	1,440	Second growth hardwood	
Iosco	1911	7	6,765 175	Slashings, plains, swamp State land.	Pine, jack pine
Iosco	1912				
Iron	1911	9	2,851	Plains, swamp, meadow	Hardwood, cedar
Iron	1912	3	209	Swamp, pine, meadow, hardwood, cedar.	Young pine
Kalkaska	1911	6	8,620	Hardwood, plains, slashings	Jackpine, hardwood
Kalkaska	1912	1	160	Slashing	
Keweenaw	1911	2	120	Slashing, swamp	Hardwood
Keweenaw	1912	1	15	Scrub pine	
Leelanau	1911	2	25	Swamp, meadow	Hardwood
Leelanau	1912				
Luce	1911	2	1,000	Plains, slashings	
Luce	1912	2	4,920	Slashing, cedar swamp	
Mackinac	1911	5	2,864	Slashing, swamp, meadow	Cedar, pine, spruce
Mackinac	1912				
Manistee	1911	4	3,085	Slashing, swamp, meadow	Pine, jackpine, hardwood.
Manistee	1912	2	5,220	Meadow	Pine and oak
Marquette	1911	8	1,535	Slashing, wild hardwood	Jackpine, hemlock, poplar
Marquette	1912	2	14	Slashing	
Menominee	1911	2	470	Slashing, swamp	Hemlock, pine, hardwood.
Menominee	1912	3	150	Pine	
Missaukee	1911	2	60	Meadow	
Missaukee	1912				
Montmorency	1911	6	6,200 2,080	Farming land, pine, hardwood State.	Jackpine, hardwood
Montmorency	1912	12	2,446	Slashings, swamp	Small pine, oak, cedar
Ogemaw	1911	4	432	Meadow, swamp	
Ogemaw	1912				
Ontonagon	1911	4	606	Slashing, brush	Hardwood

CLASSIFICATION NO. 1.—BY COUNTIES.

Other property.	Damage.	Cause.	Cost of putting fire out.
Hay, logs, fence, house, lumber	$1,445 00	Carelessness and clearing lands	.....
.....	10 00	Carelessness, engine	$7 00
Cordwood, logs, ties, posts, cedar products.	35,505 68	Clearing land	184 00
Cordwood	5,050 00	Locomotive, clearing, carelessness.	269 00
Fences, maple logs, ties, posts, flat cars, etc.	28,310 00	Incendiary and unknown causes.	84 00
.....	.....	.....	.....
Wood, logs, small vineyard, buildings, farm property, chemical wood.	36,915 00	Locomotive, unknown, campers.	2,603 00
Cottage, barn, camp property	2,400 00	Locomotives	203 60
.....	10,000 00	Unknown	60 00
.....	.....	.....	.....
Cordwood	250 00	Clearing, unknown	10 00
.....	.....	.....	.....
Hay, forest products, farm property, logs.	41,150 00	Unknown, steam loader, incendiary, clearing.	1,105 00
Chemical wood	240 00	Engines, campers, unknown, clearing.	100 00
Farm crops and property, posts, lumber camp, M. C. cars, village.	115,354 50	Unknown, locomotives, wood cutters.	1,226 00
Logs, cedar, posts, ties, cars	550 00	Engine, unknown	122 00
Pulpwood	.....	Unknown	13 75
Cedar posts, poles, ties, Norway and white pine, logs.	7,500 00	Clearing, incendiary, engines	422 00
Standing clover seed, fence, buildings, marsh hay.	1,810 00	Unknown, carelessness	29 00
.....	26 00	Campers, engines	135 00
Hardwood, cordwood	100 00	Clearing, unknown	82 50
Hemlock, cedar posts	.....	.....	6 00
Cedar posts, cordwood	835 00	Unknown, engines, campers	66 50
.....	125 00	Engines	.....
House, ties, farm buildings, mill, fence, hay.	7,250 00	Unknown, engine, clearing	510 00
.....	245 00	Clearing, unknown	253 00
Sawmill, buildings, schoolhouse, cordwood.	6,310 00	Unknown, clearing	237 50
Clubhouse, buildings, decked hemlock.	1,675 00	Carelessness, incendiary	15 00
Barn, cordwood, cedar posts	583 00	Clearing, unknown	23 00
Posts, wood, logs, barns	4,600 00	Engines, clearing	.....
Cordwood, barn	4,350 00	Carelessness, unknown	228 00
.....	.....	Clearing	.....
Mills, village, posts, berry crop	3,003,375 00	Trains, unknown	39 00
.....	.....	.....	.....
Sawmill, barn, bridge, cordwood, poles, posts, hay.	4,507 00	Clearing, unknown	612 00
Fence, crops, cedar products	1,040 60	Engine, incendiary, carelessness.	70 00
Cordwood, logs, buildings	Some benefit.	Clearing, engine	101 50
Damage	4,400 00		
.....	.....	Clearing	.....
Cordwood	300 00	Carelessness, clearing	35 00
.....	200 00	Carelessness	18 00
.....	.....	.....	72 25
.....	.....	.....	.....
.....	.....	.....	110 00
Tan bark, cedar, ties, posts, cordwood.	75 00	.....	200 00
Barn, grain	7,300 00	Carelessness, unknown	390 00
.....	.....	.....	.....
.....	1,100 00	Engine, unknown	53 00
Hay, cordwood	800 00	Engine, unknown	9 60
Posts, poles	1,198 00	Settlers, engine, unknown	178 00
.....	.....	Carelessness	5 00
.....	825 00	Unknown	25 00
Three million logs, posts, poles	40,000 00	Unknown, clearing	26 00
Barn and contents	2,525 00	Lightning	95 00
.....	.....	.....	.....
Buildings, crops, fence, lumber, hay	11,300 00	Unknown, fishermen	135 00
Cedar ties, hardwood logs, house, barn.	958 00	Clearing, fishermen, unknown, engine.	34 00
Small amount hay, cordwood, fence, logs, crops.	970 00	Unknown	4 00
.....	.....	.....	.....
Bridge	1,820 00	Unknown	5 00

RECORD OF FOREST FIRES 1911-1912.

Counties.	Year.	No. of Fires.	Acres burned.	Kind of land burned over.	Timber.
Ontonagon	1912	1	45	Slashing	.....
Oscoda	1911	3	5,900	Hardwood slashings, swamp	Jackpine
Oscoda	1912	4	2,450	Swamps, plain, brush	Norway and jackpine saplings.
Otsego	1911	8	22,580	Slashing, meadow	Hardwood, pine
			1,820	State.	
Otsego	1912	17	1,340	Slashing, plains	Second growth hardwood.
Presque Isle	1911	10	10,291	Plains, brush, swamp, meadow	Hardwood, cedar
Presque Isle	1912	....	40	State	.....
Roscommon	1911	5	1,700	Slashing, hardwood, swamp	.....
Roscommon	1912	1	160	Slashing	.....
Schoolcraft	1911	1	35	Swamp	Hemlock, hardwood, cedar
Schoolcraft	1912	5	347	Marsh, plains, hardwood	Mixed
Wexford	1911	7	1,260	Slashing, stump, meadow	Hardwood, pine
Wexford	1912	2	160	Meadow, slashing	.....
Total	1911	191	152,407	.....	.....
			4,515	State land.	
Total	1912	139	40,080	.....	.....
			40	State land.	

Amount paid to townships by state for—	1911.	1912.
1. Posting fire notices, etc.	$ 118 27	$210 55
2. Suppressing fires	4,175 35	876 38

CLASSIFICATION NO. 1.—BY COUNTIES.

Other property.	Damage.	Cause.	Cost of putting fire out.
.....	.....	Engine.....	.....
Buildings, crops, tools, schoolhouse, orchard.	$29,450 00	Clearing, unknown.....	$37 75
.....	1,550 00	Unknown, clearing.....	32 00
Fences, hay, camp, school, farm buildings, cordwood.	11,950 00	Mill, engine.....	1,105 00
Chemical wood.....	180 00	Engine.....	445 00
Logs, lumber, farm property, cattle, flat cars.	97,270 00	Unknown, lightning.....	885 00
.....	.....	.....	.....
Sawmill.....	180 00	Unknown.....	28 00
.....	100 00	Unknown.....	8 00
.....	100 00	.....	.....
Spruce, pulp, shack.....	75 00	Carelessness, unknown.....	176 50
Hay, oats, fence, cordwood, logs.....	1,520 00	Carelessness, engines.....	59 50
Hay, fence, old buildings.....	250 00	Clearing.....	.....
.....	$3,470,258 18	.....	$10,432 25
.....	$67,649 60	.....	$2,556 70

RECORD OF FOREST FIRES 1911-1912. CLASSIFICATION NO. 2. BY CAUSES.

Causes.	No.	Acres.	Kind of land.	Timber.	Other property.	Damage.	Cost.
Railway locomotives, 1911..	27	42,436 240	Slashing, swamp..... State.	Cedar hemlock, hardwood.	Resort property, vineyard, buildings, etc., logs, farm property, M. C. cars, villages, mills.	$3,074,835 00	$1,988 30
Railway locomotives, 1912..	39	12,702 40	Slashings, swamp, brush.. State.	Small pine and poplar..	Camp property, cedar products, cordwood, etc.	15,169 60	1,536 20
Carelessness, 1911.....	16	13,893	Plains, slashing, swamp-brush.	2nd growth pine, oak...	Hay, schoolhouse, farm property, sawmill.	74,806 00	446 05
Carelessness, 1912.....	21	7,942	Slashings, brush.....	Hardwood, pine, saplings.	Wood, logs.....	2,500 00	218 00
Unknown, 1911.....	90	57,091 St. 775	Swamp, meadow, slashing, good soil.	Hemlock, cedar, jackpine.	Camps, logs, poles, posts, cattle, flat cars, village, sawmill.	194,463 50	4,702 90
Unknown, 1912.....	32	12,450	Good soil, meadow, slashing.	Hemlock.....	Cedar and hemlock products....	3,700 00	561 50
Burning brush, 1911.....	12	8,086 1,500	Slashing, plains, swamp.. State.	Small trees.....	Cordwood, Cedar products, barn, tools, etc.	44,499 68	622 00
Burning brush, 1912.....	1	720	Plains, slashing.....	2nd growth hardwood..	Decked hemlock.....	75 00	.....
Clearing, 1911.....	21	6,930	Meadow, swamp, slashing.	Young pine, oak, cedar.	Logs, ties, posts, poles, pulpwood, cordwood, farm property.	25,264 00	726 50
Clearing, 1912.....	28	2,585	Slashing.....	Brush.....	.....	* 1,900 00	19 00
Settlers, 1911.....	3	1,367	Slashing.....	Hardwood.....	Logs, lumber, small buildings...	300 00	.....
Settlers, 1912.....	1	600	Plains, swamp.....	.....	.....	5 00	.....
Fishermen, 1911.....	4	1,100 2,000	Swamp, slashing, meadow. State.	Cedar.....	Mill, farm house.....	1,500 00	50 00
Fishermen, 1912.....	1	15	Scrub pine.....	.....	.....	200 00	18 00
Campers, sportsmen, etc., 1911.	9	9,945	Slashing.....	Hardwood, cedar, spruce.	Groceries, dwellings, chemical wood.	35,300 00	1,260 00
Campers, sportsmen, etc., 1912.	12	2,855	Slashing.....	Hardwood.....	Chemical wood, buildings.....	4,100 00	150 00
Incendiary, 1911.....	5	8,356 100	Meadow, brush, slashing.. State.	Hardwood, Norway and jackpine.	Chemical wood, cordwood, farm property, poles, posts.	14,130 00	281 50
Incendiary, 1912.....	3	220	Pine and swamp.....	.....	.....	.....	54 00
Lightning, mill sparks, 1911.	4	3,202	Slashing.....	.....	House, logs, barn, contents.....	5,160 00	355 00
Lightning, mill sparks, 1912.	1	.....	.....	.....	Logs, posts, poles.....	40,000 00	.....
Total, 1911.....	191	152,407 4,615	..... State.	.....	.....	$3,470,258 18	$10,432 25
Total, 1912.....	139	40,089 40	..... State.	.....	.....	$67,649 60	$2,556 70

*1,500 Benefit.

RECORD OF PROSECUTIONS IN FIRE CASES.

Counties.	People vs.—	Fine.	Costs.	Deputy.
1911.				
Antrim, July 10.....	Clarence Clark.....	$50 00	$5 00	W. H. Kittle.
Benzie, Sept. 14.....	Pavilina and Wm. Collins.	Not	guilty.	G. A. Smith.
Charlevoix, July 25...	Ray Cady.....	15 00	5 00	E. L. Stanford.
Charlevoix, July 22...	Frank Nelson.....	50 00	and costs.	E. L. Stanford.
Charlevoix, Sept. 26..	Louis Germain.....	5 00	10 00	E. L. Stanford.
Cheboygan, Sept. 6...	John Fraser.....	Dism	issed.	R. E. Ellsworth.
Crawford, July 22....	Ellsworth Hatt.....	5 00	4 10	R. S. Babbitt.
Crawford, Aug. 22....	Edw. Kellogg.....	10 00	3 00	C. J. Phelps.
Crawford, Aug. 31....	Edw. Kellogg.....	Discharged	by Justice.	.....
Dickinson, Aug. 22...	James Fast.....	Not	guilty.	E. L. Stanford.
Iron, July 6.....	Roger Smith.....	50 00	.....	John O'Connell.
Iron, July 6.....	John Smith.....	50 00	.....	John O'Connell.
Iron, Aug. 23.....	John Peterson.....	5 00	8 50	John O'Connell.
Menominee, Aug. 1...	Emery Quinett.....	1 00	12 75	John O'Connell.
Menominee, Aug. 1...	Chas. Guay.....	1 00	12 75	John O'Connell.
Presque Isle, Aug. 9..	George Addis.....	40 00	6 00	R. E. Ellsworth.
1912.				
Charlevoix, May 18...	Jos. W. Ecker.....	50 00	5 50	E. L. Stanford
Charlevoix, June 18..	Edw, Spence.....	.....	8 50	E. L. Stanford.
Crawford, May 10....	Harry Kellogg.....	10 00	3 00	C. J. Phelps.
Crawford, May 10....	Isaac Boyd.....	10 00	3 00	C. J. Phelps.
Gd. Traverse, July 3..	Adolph Wellein.....	5 00	5 00	G. A. Smith.
Gd. Traverse, July 3..	John Wellein.....	5 00	5 00	G. A. Smith.
Iron, July 2.....	John Quayle.....	Suspended.	5 50	John O'Connell.
Otsego, Aug. 8.....	Thos. Yuill.....	10 00	.....	Higgins and Babbitt.
Otsego, Aug. 8.....	John Yuill.....	10 00	.....	Higgins and Babbitt.
Wexford, May 22....	Archie Garner.....	11 85	6 15	G. A. Smith.

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